



HACKENSACK MEADOWLANDS DISTRICT
MASTER PLAN UPDATE

2020



FEBRUARY 2020 AN UPDATE TO THE 2004 MASTER PLAN



The New Jersey Sports and Exposition Authority (NJSEA) is pleased to present the Hackensack Meadowlands District Master Plan Update 2020. As the first update since 2004, this vital plan sets the pathway for the Meadowlands District’s continued and expanded economic growth and environmental preservation objectives. It exemplifies the agency’s commitment to sound regional planning that over the past 50 years has transformed the District into a premier economic hub and facilitated a remarkable environmental renaissance. The Master Plan Update will advance the substantial economic growth and development that has occurred within the Meadowlands District since the Legislature’s adoption of the Hackensack Meadowlands Reclamation and Development Act in 1968, by providing for a suitable array of land uses responsive to modern development trends, and encouraging redevelopment opportunities that foster economic vitality with job creation. It will build upon the region’s economic foundation and continue to generate quality tax ratables for constituent municipalities by assisting in the growth of established businesses, attracting new companies to the area, and offering high quality employment opportunities, while providing the framework for detailed strategic plans to address flooding, transportation, and housing affordability challenges.

Simultaneously, the Master Plan Update provides for the continued protection and enhancement of the District’s environment, as evidenced by steady improvements to the District’s water quality and the preservation and/or restoration of more than 1,000 acres of wetlands since 2004. These measures to support the biodiversity of the District and expand its available recreational opportunities are advanced in the Master Plan Update through strategic and robust natural resource planning. Significantly, the Master Plan Update also addresses critical environmental challenges, specifically climate change and sea level rise, through a new Plan element, “Sustainable Meadowlands: A Guide to Resiliency.”

The NJSEA is proud to deliver a Master Plan Update that will improve the quality of life of District residents and guide the region to economic prosperity and environmental sustainability for the years to come. This Master Plan Update reaffirms the NJSEA’s commitment to creating a more prosperous, green, and resilient Meadowlands region.



John Ballantyne
Chairman

Vincent Prieto
President, CEO



HACKENSACK MEADOWLANDS DISTRICT
MASTER PLAN UPDATE

2020

NEW JERSEY SPORTS & EXPOSITION AUTHORITY

1 DeKorte Park Plaza
Lyndhurst, NJ 07071

www.njsea.com

CHAIRMAN

John Ballantyne

VICE CHAIRMAN

Joseph Buckelew

PRESIDENT/CEO

Vincent Prieto

BOARD MEMBERS

John Ballantyne

Joseph Buckelew

Robert J. Dowd

Armando B. Fontoura

Michael H. Gluck

Woody Knopf

Elizabeth Maher Muoio

Steven Plofker, Esq.

Andrew Scala

Anthony Scardino

Louis J. Stellato

Robert B. Yudin

TABLE OF CONTENTS

1. INTRODUCTION

- I. Hackensack Meadowlands District 1-2
- II. NJSEA Structure 1-4
- III. Constituent Municipalities. 1-5
- IV. Goals and Objectives 1-6
- V. The Meadowlands Plan: A 50-Year Retrospect. 1-12

Figure

- 1.1 - Constituent Municipalities within the Hackensack Meadowlands District 1-2

2. POPULATION AND ECONOMY

- I. Population 2-2
- II. Employment. 2-6
- III. Economy 2-10
- IV. Real Estate Trends. 2-14
- V. State of New Jersey Economic Development Incentives 2-16

Figures

- 2.1 - Land within the Hackensack Meadowlands District, by Municipality 2-1
- 2.2 - Population of Meadowlands District Municipalities 2-3
- 2.3 - Population Changes of Meadowlands District Municipalities 2-3
- 2.4 - Household Income Profile (2000-2018) 2-4
- 2.5 - Median Household and Per Capita Income (2018 and 2023) 2-5
- 2.6 - Educational Attainment (2010-2018) 2-6
- 2.7 - Labor Force by Employment Status. 2-7
- 2.8 - Paid Employees in Bergen and Hudson Counties by NAICS Code 2-8
- 2.9 - Top Industries within Bergen and Hudson Counties (2000-2018). 2-9
- 2.10 - Employment Trends(2000 – 2018). 2-10
- 2.11 - Real GDP (Chained 2009 Dollars). 2-12
- 2.12 - Year over Year Percent Changes in CPI-U For Urban Consumers: New York MSA 2-13
- 2.13 - Employer Value of Sales, Shipments, Receipts, Revenue or Business Done in District Municipalities 2-14
- 2.14 - Industrial Market Inventory, Lease and Vacancy Rates 2-15
- 2.15 - Office Market Inventory, Lease and Vacancy Rates 2-16

3. LAND USE

- I. Existing Land Uses 3-1
- II. Land Use Trends 3-4
- III. Redevelopment 3-19

IV. Historic Resources 3-27

V. Build-Out 3-29

Figures

3.1 - Existing Land Uses within the Hackensack Meadowlands District 3-3

3.2 - Land Use Changes within the District since 2004 3-4

3.3 - Natural Areas 3-5

3.4 - Development Sites Classified as Wetlands or Water Land Use in 2004 3-7

3.5 - Public Parks and Recreation Areas in the Meadowlands District 3-9

3.6 - Developed Areas 3-13

3.7 - Hotels in the Meadowlands 3-16

3.8 - Other Areas 3-18

3.9 - Redevelopment Areas in the Hackensack Meadowlands District 3-20

3.10 - Historic Resources in the Hackensack Meadowlands District 3-27

3.11 - Development Completed Compared to 2004 Master Plan Estimate 3-29

4. HOUSING

I. Household Profiles 4-1

II. Housing Stock Characteristics 4-3

III. Housing Affordability 4-8

IV. Fair Housing Act 4-10

V. Hackensack Meadowlands District Fair Housing Milestones 4-12

VI. NJSEA Interim Policies and Site Suitability Guidelines 4-13

VII. Constituent Municipality Housing Plans 4-16

Figures

4.1 - Number of Households in District Municipalities 4-2

4.2 - Average Household Size in District Municipalities 4-2

4.3 - Households by Family Type 4-3

4.4 - Housing Units in District Municipalities 4-4

4.5 - Change in Housing Units, By Type (2000-2016) 4-5

4.6 - Homeownership Rates (Housing Tenure: Owner vs Renter Occupied Units) 4-6

4.7 - Housing Vacancy Rates in District Municipalities 4-6

4.8 - Median Sale List Prices for All Homes 4-7

4.9 - Residential Building Permits Authorized in District Municipalities 4-8

4.10 - Housing Affordability Profile 4-9

4.11 - Median Household Income 4-10

4.12 - Affordable Housing Regional Income Limits 4-11

4.13 - Housing Development within the Meadowlands District (2004-2018) 4-15

4.14 - Affordable Housing Obligations by Constituent Municipality 4-16

5. ENVIRONMENT

- I. Waterways 5-1
- II. Wetlands 5-2
- III. Coastal Zone Management 5-8
- IV. Floodplain Management 5-8
- V. Water Quality 5-13
- VI. Biota 5-15
- VII. Solid Waste Management 5-22
- VIII. Water and Wastewater Treatment 5-23
- IX. Energy 5-25

Figures

- 5.1 - Acres of Wetland Restoration, Mitigation, and Preservation Sites in the Meadowlands District 5-4
- 5.2 - Wetlands Restoration, Mitigation, and Preservation Sites in the Meadowlands District . . 5-5
- 5.3 - Water Control Methods for the Hackensack River and its Tributaries within the Meadowlands District 5-10
- 5.4 - Hackensack River Network Surface Water Classification in the District 5-13
- 5.5 - Dissolved Oxygen Concentrations in the Lower Hackensack River 5-14
- 5.6 - Average Fecal Coliforms 5-14
- 5.7 - Benthic Community Composition 5-16
- 5.8 - Comparison of Relative Abundance of Fish Species 5-17
- 5.9 - Endangered, Threatened and Special Concern Species in the Meadowlands District . . 5-20
- 5.10 - Water Providers Serving District Municipalities 5-24
- 5.11 - Wastewater Treatment Facilities Serving District Municipalities 5-24
- 5.12 - Energy Consumption by Source 5-25
- 5.13 - Total Energy Consumption Per Capita in New Jersey by Sector (in Btus) 5-26

6. CIRCULATION

- I. Planning and Regulatory Framework 6-1
- II. Mobility 6-2
- III. Safety 6-18
- IV. Conclusion 6-23

Figures

- 6.1 - Functional Classification of Roadways 6-5
- 6.2 - Traffic Volumes of Major Roadways 6-7
- 6.3 - Annual Average Daily Traffic by Municipality 6-8
- 6.4 - Total Crashes- Bergen and Hudson Counties Combined (2004-2017) 6-19
- 6.5 - Total Crashes- Major State Highways (2004-2017) 6-20
- 6.6 - Total Crashes in District Municipalities (2010-2017) 6-21
- 6.7 - In District High Crash Rate Locations 6-22
- 6.8 - Safety Data for the Northern New Jersey Region (Year 2016-2018) 6-23

7. SYSTEMS PLAN

- I. System 1: Natural Environment 7-1
- II. System 2: Economic Development 7-4
- III. System 3: Transportation. 7-7
- IV. System 4: Housing. 7-11
- V. System 5: Community Facilities 7-13
- VI. System 6: Historic Resources 7-14

Figures

(None)

8. AREA PLANS

- I. Planning Areas 8-1
- II. Plan Comparisons 8-11

Figure

- 8.1 - Planning Areas – 2020 Hackensack Meadowlands District Land Use Plan. 8-2

9. SUSTAINABLE MEADOWLANDS: A GUIDE TO RESILIENCY

- I. The Hackensack Meadowlands District 9-1
- II. NJSEA Resiliency and Stewardship Efforts 9-2
- III. Superstorm Sandy 9-8
- IV. Sea Level Rise 9-14
- V. Resiliency Strategies. 9-18
- VI. Conclusion. 9-24

Figures

- 9.1 - Water Levels at Carlstadt River Barge Park Marina During Superstorm Sandy 9-11
- 9.2 - Sea Level Rise (SLR) Projections for New Jersey. 9-15
- 9.3 - Probability that Sea Level Rise at Atlantic City will Meet or Exceed Stated Values in Stated Years. 9-16
- 9.4 - Surface Elevation Change of Select Marshes in the District 9-17

ACKNOWLEDGEMENTS:

Demographic and market data utilized to prepare the Hackensack Meadowlands District Master Plan Update 2020 was provided, in part, by 4Ward Planning, Inc.

Selected photos in the Hackensack Meadowlands District Master Plan Update 2020 have been provided courtesy of Jim Wright, M.E. Raine, Ron Shields, Joe Koscielny and the Meadowlands Environmental Research Institute (MERI)

MAPS

1. REGIONAL LOCATION
2. DISTRICT MUNICIPALITIES
3. EXISTING LAND USE
4. PUBLIC PARKLAND
5. HISTORIC RESOURCES
6. REDEVELOPMENT AREAS
7. WETLAND MITIGATION, RESTORATION, AND PRESERVATION SITES
8. FEMA SPECIAL FLOOD HAZARD AREAS (2019)
9. UTILITY SERVICE AREAS
10. PHOTOVOLTAIC SOLAR INSTALLATIONS
11. ROADWAY NETWORK
12. MASSTR ADAPTIVE SIGNAL MAP
13. RAIL SYSTEM (PASSENGER & FREIGHT)
14. BUS ROUTES & PARK AND RIDE FACILITIES
15. NJDOT CRASH DATA (2015 TO 2017)
16. LAND USE PLAN
17. SUPERSTORM SANDY INUNDATION (2012)
18. INUNDATION FOOTPRINT IN 2050- 2FT SEA LEVEL RISE PROJECTION
19. INUNDATION FOOTPRINT IN 2100- 3FT SEA LEVEL RISE PROJECTION

ACRONYMS & ABBREVIATIONS

AADT	Annual Average Daily Traffic	MIMAC	Meadowlands Interagency Mitigation Advisory Committee
AHA	Affordable Housing Alliance	MP	Mile Post
APTA	American Public Transportation Association	MRC	Meadowlands Regional Chamber
AVID	Advanced Identification	MSA	Metropolitan Statistical Area
BAC	Business Action Center	MTPD	Meadowlands Transportation Planning District
BCSA	Berry's Creek Study Area	NAICS	North American Industry Classification System
BCUA	Bergen County Utilities Authority	NAR	National Association of Realtors
BEA	Bureau of Economic Analysis	NAVD 88	North American Vertical Datum of 1988
BFE	Base Flood Elevation	NEC	Northeast Corridor
BLS	Bureau of Labor Statistics	NEPA	National Environmental Policy Act
Btu	British thermal unit	NFIP	National Flood Insurance Program
CMP	Comprehensive Management Plan	NJDEP	New Jersey Department of Environmental Protection
COAH	Council on Affordable Housing	NJDOT	New Jersey Department of Transportation
CPI	Consumer Price Index	NJDOL	New Jersey Department of Labor
CRS	Community Rating System	NJEDA	New Jersey Economic Development Authority
CWA	Clean Water Act	NJEMP	New Jersey Energy Master Plan
CWS	Community Water System	NJGIN	New Jersey Geographic Information Network
CZM	Coastal Zone Management	NJMC	New Jersey Meadowlands Commission
CZMA	Coastal Zone Management Act	NJSEA	New Jersey Sports and Exposition Authority
CZMP	Coastal Zone Management Program	NJTA	New Jersey Turnpike Authority
DCA	Department of Community Affairs	NJTPA	North Jersey Transportation Planning Authority
DMA 2000	Disaster Mitigation Act of 2000	NOAA	National Oceanic and Atmospheric Agency
DO	Dissolved Oxygen	NTD	National Transit Database
DPW	Department of Public Works	NYMTC	New York Metropolitan Transportation Council
ECG	East Coast Greenway	NYS & W	New York Susquehanna and Western Railroad
EIS	Environmental Impact Statement	PANYNJ	Port Authority of New York and New Jersey
FEMA	Federal Emergency Management Act	PATH	Port Authority Trans Hudson
FHA	Fair Housing Act	PIA	Project Impact Assessment
FHWA	Federal Highway Administration	PSEG	Public Service Enterprise Group
FIRM	Flood Insurance Rate Maps	RBDM	Rebuild by Design Meadowlands
FMP	Floodplain Management Plan	ROD	Record of Decision
FSHC	Fair Share Housing Center	ROW	Right of Way
FTA	Federal Transit Administration	RPA	Regional Plan Association
GDP	Gross Domestic Product	SAMP	Special Area Management Plan
GIS	Geographic Information Systems	SDRP	State Development and Redevelopment Plan
GSP	Gross State Product	SDWA	Safe Drinking Water Act
HBLR	Hudson-Bergen Light Rail	SFHA	Special Flood Hazard Area
HDSRF	Hazardous Discharge Site Remediation Fund	SIC	Standard Industrial Classification
HMDC	Hackensack Meadowlands Development Commission	SOV	Single Occupant Vehicle
HMMC	Hackensack Meadowlands Municipal Committee	SPA	Specially Planned Area
HMP	Hazard Mitigation Plan	STEM	Science, Technology, Engineering, and Math
HRE	Hudson Raritan Estuary	STVRP	Secaucus Transit Village Redevelopment Plan
HUD	Housing and Urban Development	TDM	Transportation Demand Management
IAWG	InterAgency Working Group	TEA-21	Transportation Equity Act for the 21st Century
IRT	Interagency Review Team	TEU	Twenty Cubic Foot Equivalent Container Unit
ITE	Institute of Transportation Engineers	TIGER	Transportation Investment Generating Economic Recovery
LEED	Leadership in Energy and Environmental Design	TOD	Transit Oriented Development
LRHL	Local Redevelopment and Housing Law	TPD	Transportation Planning District
MASSTR	Meadowlands Adaptive Signal System for Traffic Reduction	UEZ	Urban Enterprise Zone
MCRIP	Meadowlands Comprehensive Restoration Implementation Plan	USACE	United States Army Corps of Engineers
MCT	Meadowlands Conservation Trust	USEPA	United States Environmental Protection Agency
MDTP	Meadowlands District Transportation Plan	USGBC-NJ	US Green Building Council of New Jersey
MEC	Meadowlands Environment Center	USGS	United States Geological Survey
MERI	Meadowlands Environmental Research Institute	USFWS	United States Fish and Wildlife Service
MESIC	Meadowlands Environmental Site Investigation Compilation	VPD	Vehicles Per Day
		WQX	Water Quality Exchange

INTRODUCTION

1

1. INTRODUCTION

The New Jersey Sports and Exposition Authority (NJSEA) is an authority of the State of New Jersey, created in 1971. The NJSEA is responsible for the management of various sports and entertainment facilities in the State of New Jersey, including the Meadowlands Sports Complex in East Rutherford, Monmouth Racetrack in Oceanport, and the Wildwood Convention Center in Wildwood.

On February 5, 2015, the Hackensack Meadowlands Agency Consolidation Act (P.L. 2015, c.19) (“Consolidation Act”), merged the former New Jersey Meadowlands Commission (NJMC) and its core functions into the NJSEA. The NJSEA continues the NJMC’s role as the regional planning and zoning agency for the Hackensack Meadowlands District (District), which consists of portions of 14 towns in Bergen and Hudson Counties. The Hackensack Meadowlands District was originally established by the Hackensack Meadowlands Reclamation and Development Act in 1968.

The fundamental mandates for the District are unchanged since the merger. The NJSEA is charged with providing for the orderly development of the District, providing facilities for the sanitary disposal of solid waste, and protecting the delicate balance of nature. Accordingly, this Hackensack Meadowlands District Master Plan Update 2020 will outline the NJSEA’s policy objectives in relation to these mandates, and serves as the primary planning and policy document for the Hackensack Meadowlands District.

This Master Plan also serves as an update to and supersedes the 2004 NJMC Master Plan for the District. This document is composed of nine chapters, followed by a series of maps. The first six chapters represent the research and evaluation of current conditions in the District, and include comparisons to the conditions existing in 2004. The final three chapters contain the Master Plan Update and provide a policy framework for the District for the next 10 years, building upon the policies established in the 2004 Master Plan.



This Master Plan is comprised of the following Chapters:

1. Introduction
2. Population and Economy
3. Land Use
4. Housing
5. Environment
6. Circulation
7. Systems Plan
8. Area Plans
9. Sustainable Meadowlands: A Guide to Resiliency

Pursuant to the Act, the Hackensack Meadowlands District Master Plan is required to be adopted by February 5, 2020, which is five years from the date of the merger of the former NJMC with the NJSEA. The Act also requires a master plan examination and revision be conducted by the NJSEA every 10 years, after the adoption of this Master Plan Update. Per N.J.S.A. 5:10A-10, this master plan does not apply to the Meadowlands Sports Complex, although the property is in within the District boundaries.

I. HACKENSACK MEADOWLANDS DISTRICT

The Hackensack Meadowlands District is a unique landscape, composed of an amalgam of natural and developed areas bisected by the Hackensack River and crisscrossed by major transportation corridors.

The 30.3-square-mile District is located approximately five miles west of New York City in northern New Jersey and encompasses portions of fourteen municipalities in two counties, Bergen and Hudson, as shown in Figure 1.1 “Constituent Municipalities within the Hackensack Meadowlands District.”

The District’s general boundaries are constituted by Route 46 to the north; Routes 1 and 9 (Tonnel Avenue) and the freight rail line owned by Norfolk Southern and CSX Corp. (the former Conrail main line) to the east; the Port Authority Trans Hudson (PATH) commuter rail lines and Pulaski Skyway to the south; and, Route 17, the Pascack Valley rail line, and the Kingsland rail line to the west. The District’s geographic location is presented as [Map 1 – Regional Location](#) in the map section at the end of this document. [Map 2 – District Municipalities](#) identifies the boundaries of the political jurisdictions within the District.

Figure 1.1 CONSTITUENT MUNICIPALITIES WITHIN THE HACKENSACK MEADOWLANDS DISTRICT

BERGEN COUNTY	HUDSON COUNTY
Carlstadt	Jersey City
East Rutherford	Kearny
Little Ferry	North Bergen
Lyndhurst	Secaucus
Moonachie	
North Arlington	
Ridgefield	
Rutherford	
South Hackensack	
Teterboro	

The NJSEA holds zoning jurisdiction over the portions of each municipality within its boundaries. The Consolidation Act allows constituent municipalities to administer the majority of the zoning requirements of the NJSEA, upon adoption of an “opt-out” resolution agreeing to follow the land use provisions of the District’s zoning regulations. Any applications for use variances, subdivisions, and regulatory amendments are retained for review by the NJSEA, as are any applications that are deemed to be vital projects. To date, the Towns of Secaucus and Kearny have chosen to become “opt-out” municipalities.

II. NJSEA STRUCTURE

The NJSEA is an Authority of the State of New Jersey established within the Department of State. It is headed by a Board of Commissioners, which is supported by various divisions responsible for the implementation of the NJSEA’s statutory responsibilities, as follows:

A. BOARD OF COMMISSIONERS

The NJSEA Board of Commissioners is composed of 16 Commissioners (11 members appointed by the Governor with the advice and consent of the Senate, one member appointed by the President of the Senate, and one member appointed by the Speaker of the General Assembly, appointed for four-year terms, plus three ex officio members, including the State Treasurer). The Board meets monthly and votes on resolutions related to the operations and policies of the NJSEA. The Board includes a Chairman and Vice Chairman. The President and Chief Executive Officer (CEO) of the NJSEA serves as Secretary of the Board of Commissioners.

B. EXECUTIVE

The Executive division of the NJSEA, headed by the President and CEO, directs the agency’s operations and formulates the policies governing agency actions. The NJSEA’s legal and regulatory affairs, public relations, human resources, and ethics personnel are members of this division.

C. FINANCE

The Finance division of the NJSEA is responsible for administering the Intermunicipal Tax Sharing Fund, maintaining escrow funds, as well as the accounts payable and receivable functions of the NJSEA. The NJSEA conducts an annual independent audit of its finances.

D. SOLID WASTE

The NJSEA administers the Hackensack Meadowlands District Solid Waste Management Plan and ensures the proper control, closure, and remediation of landfills throughout the District. In 1969, there were nearly 1,900 acres of unregulated landfills in the region. Today most of those landfills have been closed and remediated under the jurisdiction of the New Jersey Department of Environmental Protection (NJDEP) and the NJSEA as the administrator of the Hackensack Meadowlands Solid Waste Management District.

E. NATURAL RESOURCES

Improvements to the Meadowlands’ unique urban ecosystem are supported by the work of the Natural Resources Management Department. The Department conducts surveys on area wildlife and looks for ways to enhance and preserve the environment by protecting wetlands and native plants and animals, and by finding ways to eliminate or reduce invasive flora and nuisance fauna. The research performed by the Natural Resources Management Department furthers the NJSEA’s ongoing commitment to exploring ways to improve and protect vital natural resources in the Meadowlands

District. The Natural Resources Management Department also oversees the stormwater management functions of the NJSEA, as more fully explained in [Chapter 5 – Environment](#), including preparation of the NJSEA’s Floodplain Management Plan, maintaining the District’s Community Rating System reporting requirements, inspecting stormwater management facilities in the District, and assisting District property owners, residents and businesses with flooding concerns. These activities are performed in conjunction with NJSEA Land Use Management staff.

F. LAND USE MANAGEMENT

The NJSEA maintains a professional staff of engineers, planners, and construction code officials within the Division of Land Use Management (LUM) to administer land use and construction code regulations within the District. The LUM division is responsible for the District’s master planning, redevelopment planning, rezoning, and the maintenance of the Official Zoning Map for the District. The staff also conducts site plan and subdivision reviews to evaluate consistency with the District’s applicable land use regulations. A zoning certificate must be obtained prior to the improvement or filling of a site, the construction of, or addition to, any structure, and/or changes of use within existing buildings. Additionally, the NJSEA issues occupancy certification prior to any change of tenancy in the District to certify the proposed use or occupancy complies with the applicable regulations. Prior to the start of any new construction or alterations to existing structures, the NJSEA conducts a construction code plan review in accordance with the State building code. The NJSEA partners in the building code review process with the constituent municipalities’ construction officials, who are responsible for issuing construction permits upon approval by the NJSEA. LUM reviews approximately 500 to 600 applications annually.

G. AFFILIATES

The NJSEA also collaborates closely with the following affiliated entities to accomplish its environmental preservation and scientific research objectives:

1. MEADOWLANDS CONSERVATION TRUST

The Meadowlands Conservation Trust (MCT) was formed in 1999 to acquire and preserve environmentally valuable land; to provide for open space and public outdoor passive recreational opportunities; and to enhance the environment of the Hackensack Meadowlands District and the Hackensack River Watershed. The MCT has been instrumental in the acquisition and management of significant wetland parcels in the District, including the 587-acre Richard P. Kane wetland site in Carlstadt and South Hackensack. The MCT is supported in part by the NJSEA through the use of staff and facilities.

2. MEADOWLANDS ENVIRONMENTAL RESEARCH INSTITUTE

The Meadowlands Environmental Research Institute (MERI) was created in 1998 to provide the knowledge and conduct the research necessary to understand, conserve, protect, and manage the District’s ecosystems, and to promote sharing of information and resources. In 2014, MERI became a part of Rutgers University, and remains closely affiliated with the NJSEA. MERI is organized around four operational units:

- a. Analytical Laboratory:** Provides chemical analytical services to support environmental research and monitoring programs and assist state and federal agencies in addressing the legacy environmental pollution issues in the District.

- a. **Environmental Monitoring:** Maintains a network of field monitoring stations to continuously capture water and air quality, the water levels in District waterways and marshes, sea level rise, and carbon sequestration levels within the District waterways and open lands.
- b. **Geographic Information System (GIS):** Provides NJSEA and the 14 District municipalities with property information along with a suite of maps, tools, and training to share and access a variety of District-specific geographic information. This group oversees the acquisition of land cover images by drone and updated topography information. It maintains online platforms to share this information with NJSEA staff, local government, state, and federal agencies. This information can be used to manage public assets, plan for improvements, and prepare for emergencies.
- c. **Library and Environmental Data:** The library serves as the principal repository for Meadowlands District documents and reports. The library is responsible for holding the collective environmental and institutional memory of the Hackensack Meadowlands District.

III. CONSTITUENT MUNICIPALITIES

A. HACKENSACK MEADOWLANDS MUNICIPAL COMMITTEE

In recognition of the need to maintain public input and interaction with local governments, the 1969 Act established the Hackensack Meadowlands Municipal Committee (HMMC), which consists of the chief executive of each constituent municipality or his/her alternate. The HMMC may review all proposed codes and standards, master plans or amendments, development and redevelopment or improvement plans, and other major decisions of the NJSEA. The HMMC also has the authority to veto proposed master plans, regulations, rezonings, and redevelopment plans. The NJSEA Board of Commissioners may override any such veto with an affirmative vote of the majority of the members of the Board.

B. INTERMUNICIPAL TAX SHARING

Tax sharing is a mechanism through which the constituent municipalities of the District equitably share in the financial benefits and new costs resulting from the development of the Meadowlands District as a whole. The Meadowlands District Intermunicipal Tax Sharing Program (“tax sharing”) was enacted by the New Jersey Legislature in 1972. The intent of the program is to moderate competition for tax ratables by ensuring that each municipality receives a fair share of the property tax generated by new development within the District as a whole, regardless of the amount of land slated for development versus preservation per municipality.

Properties in the Meadowlands portion of each municipality are taxed in exactly the same manner as all other properties. Each municipality pays its county taxes, and the remaining taxation, minus the amount collected on ratables existing in 1970, is subject to tax sharing. The NJSEA then calculates the Meadowlands Adjustment Payment based on a number of factors. The Meadowlands Adjustment Payment is determined by the average of the three preceding years’ calculations.

The constituent municipalities directly retain 60 percent of the revenues remaining after payment of county taxes and the deduction of base-year 1970 ratables. Each municipality then receives an adjustment equal to the per pupil cost of education for school pupils in excess of base-year 1970 enrollment living within the District. Each municipality also receives an additional adjustment reflecting the percentage of property it has within the Meadowlands District. Those municipalities

whose total credits are larger than the amount subject to tax sharing are receivers from the Intermunicipal Account. Prior to 2015, those municipalities whose total credits were smaller than the amount subject to tax sharing were contributors to the Intermunicipal Account.

In 2015, the Consolidation Act altered the funding structure of the tax sharing program by authorizing the levy of a tax on hotels within the Meadowlands District boundaries to fund the Intermunicipal Account, thus eliminating the payment requirements of the contributor municipalities. Receiver municipalities continue to receive funds through the Intermunicipal Account. In 2018, this funding structure was amended to include a tax on all hotels within the District's 14 constituent municipalities (P.L. 2018, Chapter 52), and other transient accommodations, such as AirBnB (P.L. 2018, Chapter 49). In addition, P.L. 2018, Chapter 130 added a 1.25 percent levy on the net amounts received from sports betting at the Meadowlands Racetrack to be remitted into the Intermunicipal Account.

The NJSEA serves only as a conduit for the municipal payments and does not benefit in any way from the formula. Every January, the NJSEA certifies to the Chief Financial Officer of each District municipality the amount of the municipality's adjustment payment for receiving municipalities.

IV. GOALS AND OBJECTIVES

This Master Plan serves as the NJSEA's primary policy and planning document for the Hackensack Meadowlands District. This document guides future decision-making; serves as the basis for the implementation of policies, including future amendments to the NJSEA's regulations codified at N.J.A.C. 19:3-1.1, et seq.; and promotes the creation of additional studies and plans with a more refined focus.

This Master Plan was developed to achieve the following goals and objectives for the Hackensack Meadowlands District:

1. To safeguard and restore the Hackensack Meadowlands' irreplaceable heritage of natural and historical resources.
2. To promote a suitable array of land uses that encourages economic vitality with job creation and supports the public health, safety, and general welfare.
3. To foster the Meadowlands economy in a manner that stimulates job growth and prosperity.
4. To create a sense of place that captures the character and identity of the Meadowlands.
5. To facilitate the creation of housing opportunities in suitable locations to accommodate the needs of the region's population.
6. To promote a regional transportation network that improves the mobility of people and freight, fuels economic development, and minimizes negative impacts upon the environment.
7. To increase the security and resiliency of the District and its neighboring areas by mitigating hazards and risks.
8. To encourage the development and use of reliable, responsible, low-carbon and alternative energy sources while reducing energy consumption.



PHOTO COURTESY OF M.E. RAINE

9. To direct the NJSEA's policies and practices toward a sustainable Meadowlands.
10. To provide excellence in public service.
11. To deliver the vision of this Master Plan in solidarity with other District stakeholders.

The goals and objectives of this Master Plan build upon those established in 2004. A vision statement containing assumptions, standards, and principles is provided below that further refines each goal and objective in order to address current conditions:

1. TO SAFEGUARD AND RESTORE THE HACKENSACK MEADOWLANDS' IRREPLACEABLE HERITAGE OF NATURAL AND HISTORICAL RESOURCES.

The Hackensack Meadowlands constitute the largest remaining complex of brackish tidal wetlands in the New York and New Jersey Harbor Estuary. Despite the historical filling of wetlands that has occurred, starting with the land reclamation efforts of the region's early European settlers, followed by the years of abuse and neglect caused by pollution and dumping that pre-dated the formation of the District, the ecological landscape has been dramatically transformed for the better under the stewardship of the NJSEA and its predecessors. The Meadowlands now supports a wide diversity of animal and plant life, including endangered or threatened species, such as the northern harrier and the yellow-crowned night heron. A total of approximately 3,500 acres of wetlands have been preserved, restored, and/or mitigated in the District, an increase of more than 1,000 acres since the 2004 Master Plan.

Although much has been accomplished, more work lies ahead. Ongoing initiatives to promote biological diversity and to remediate contaminated conditions are necessary for the Meadowlands to become an even more productive ecosystem and to enhance its magnificent scenic beauty. The NJSEA remains committed to preserving the District's remaining wetlands and waterways and, in partnership with the MCT, will pursue the acquisition of additional environmentally sensitive sites as opportunities and funding for site acquisition and property maintenance become available. The NJSEA will also continue its implementation of enhancement activities to restore the function of degraded wetlands to provide quality fisheries, wildlife habitat, and water quality improvements. The District's network of preservation areas, trails, and other green elements will continue to grow to benefit both eco-tourists and wildlife.

In addition, the District's unique historical, architectural, and archaeological resources should be preserved and protected to the extent possible.

2. TO PROMOTE A SUITABLE ARRAY OF LAND USES THAT ENCOURAGES ECONOMIC VITALITY WITH JOB CREATION AND SUPPORTS THE PUBLIC HEALTH, SAFETY, AND GENERAL WELFARE.

The land use planning efforts of the NJSEA promote a diversity of uses to support the well-being of people and places in the District. The management of how these uses interact with each other and the various systems of the Meadowlands (as further detailed in [Chapter 7 – Systems Plan](#)) is one of the principal functions of the NJSEA.

As a designated smart growth area within the State, the NJSEA recognizes that the realization of the vision plan for the future of the Meadowlands District, as established in this master plan, must incorporate smart growth policies. These policies encourage redevelopment within compact, walkable centers with access to transit, open space, and recreational amenities, protect open space, conserve natural resources, and promote transportation options to reduce automobile traffic and dependency. Land use policies will be directed toward the development and redevelopment

of upland areas within the capacity of the land, infrastructure, and community services. These development objectives will be advanced to ensure the preservation of environmentally-sensitive lands and the facilitation of restoration efforts.

Infill development will consider the character of the existing built environment in and around the area it proposes to occupy. Buffers between uses of differing intensities will continue to be utilized to minimize impacts to existing land uses.

Zoning and land use policies will support a sustainable Meadowlands population and economy through implementation of the planning objectives provided in the Systems, Area, and Sustainable Meadowlands Plans, found in Chapters 7 through 9 of this Master Plan.

3. TO FOSTER THE MEADOWLANDS ECONOMY IN A MANNER THAT STIMULATES JOB GROWTH AND PROSPERITY.

The Meadowlands District offers employers a prime location to interface with the global marketplace, a diverse economic base, and access to a highly skilled labor pool and higher education institutions. The NJSEA seeks to build upon the District's economic foundation and continue to generate quality tax ratables for the District's constituent municipalities through helping existing businesses thrive, attracting new businesses to the District, and providing high quality employment opportunities through prudent land use policies.

Although vacant, developable land is very scarce, the District's brownfields offer exceptional opportunities for new development to sustain the expansion of the Meadowlands economy. As an example, the 1,363-acre Kingsland Redevelopment Area will facilitate the proper closure of eight former landfills and promote the creation of a nexus where industrial development, alternative energy companies, and other commercial enterprises thrive in tandem with the natural environment. In addition, outdated warehouse buildings throughout the District are regularly remodeled into modern, high-tech distribution centers to respond to market requirements.

The NJSEA also seeks to attract a growing number of visitors to the Hackensack Meadowlands District through the incorporation of land use policies that complement the thriving sports and entertainment facilities in the region. Although outside of the scope of this Master Plan, the NJSEA's Meadowlands Sports Complex property contains American Dream Meadowlands, which is slated to be the largest retail and entertainment complex in the nation, as well as MetLife Stadium, the home of the New York Jets and the New York Giants and a premier entertainment venue, which draws visitors to the region throughout the year and hosted global events such as the World Cup, the Papal Visit, and the National Football League's Super Bowl in 2014. Both of these facilities, in addition to the Meadowlands Racetrack, continue to spur development interest in surrounding areas and will contribute to the region's economic growth.

Moreover, the NJSEA recognizes that economic development means more than just bricks and mortar. Since the adoption of the 2004 Master Plan, the NJSEA has pursued a number of business development and outreach strategies in partnership with the business community. For example, the Meadowlands Liberty Convention and Visitors Bureau, a joint venture between the Meadowlands Regional Chamber (MRC) and the NJSEA, markets the region to draw visitors and jobs to the area.

The NJSEA will also seek to promote advances in the region's eco-tourism sector to provide an enhanced experience to visitors' enjoyment of the natural wonders of the Meadowlands.

4. TO CREATE A SENSE OF PLACE THAT CAPTURES THE CHARACTER AND IDENTITY OF THE MEADOWLANDS.

The NJSEA is striving to create a Meadowlands identity as a place of exemplary quality where people live, work, play, and visit. The District's outstanding natural areas, public spaces, facilities, and services offer prime opportunities for physical activity and recreation. Creative design elements and the establishment of key gateways to the District should be pursued.

A means of establishing the identity of the Meadowlands is to foster environmental education. The NJSEA will continue to be a leader in providing innovative, high quality educational programs for all ages to convey an understanding of the District's natural environment and unique historic and archaeological heritage. Such programs will reinforce the vision of this Master Plan and introduce and impart the role of environmental stewardship to participants.

5. TO FACILITATE THE CREATION OF HOUSING OPPORTUNITIES IN SUITABLE LOCATIONS TO ACCOMMODATE THE NEEDS OF THE REGION'S POPULATION.

New jobs will bring new residents into the region, increasing the numbers of households requiring housing that meets their needs. New housing will continue to be located adjacent to compatible land uses with suitable access to infrastructure, employment opportunities, community facilities, and public transportation. Strategies to spur the development of housing will remain cognizant of the limits of community facilities, especially public schools, emergency services, and road capacity. Moreover, land use provisions will balance the need for housing with other needs, particularly the needs for environmental preservation. The creation of new housing in the District must also address the housing affordability needs of the region's population, within a framework of security and resiliency.

6. TO PROMOTE A REGIONAL TRANSPORTATION NETWORK THAT IMPROVES THE MOBILITY OF PEOPLE AND FREIGHT, FUELS ECONOMIC DEVELOPMENT, AND MINIMIZES NEGATIVE IMPACTS UPON THE ENVIRONMENT.

The District serves as a key geographic component of northern New Jersey's transportation system, and is a destination in its own right. The NJSEA promotes those improvements, inclusive of innovative technologies, that enhance and optimize the current network and its ability to meet future demands. Additionally, the NJSEA considers the impacts of its land use policies and decisions upon the transportation network and requires mitigation of those impacts to the fullest extent practicable. The Meadowlands Transportation Planning District (MTPD) will continue to respond to emerging issues, including aging infrastructure and the improvements needed for successful redevelopment. While the MTPD boundaries are coterminous with the District, the NJSEA is committed to working cooperatively with those entities with jurisdiction beyond its borders to promote the efficiency and safety of the region's transportation network.

The NJSEA's activities will also continue to promote a wider range of transportation choices, particularly the expansion of mass transit opportunities, to ease congestion on the roads and greenhouse gas emissions. Pedestrian and bicycle circulation improvements are also encouraged through the NJSEA's planning activities.

7. TO INCREASE THE SECURITY AND RESILIENCY OF THE DISTRICT AND ITS NEIGHBORING AREAS BY MITIGATING HAZARDS AND RISKS.

Safe and healthy environments promote personal security and are critical to a high quality of life. Human exposure to harmful substances is regulated through the proper disposal of hazardous substances, the remediation of brownfields, and land use controls. Such controls include, but

are not limited to, requirements for adequate drainage and water quality, flood-proof design, and environmental standards regulating air quality, noise, vibrations, glare, hazardous and radioactive substances, wastewater, and imported soils.

The potential for sudden events, including flooding, wildfires, or other threats, must be minimized through resilient design. In addition, the District's transportation and utility networks must be properly maintained to provide safe and efficient networks to serve the District's population and support the region's economy.

8. TO ENCOURAGE THE DEVELOPMENT AND USE OF RELIABLE, RESPONSIBLE, LOW-CARBON AND ALTERNATIVE ENERGY SOURCES WHILE REDUCING ENERGY CONSUMPTION.

The NJSEA is committed to promoting the use of renewable energy and reductions in fossil fuel consumption, and aligns the policies herein with the State of New Jersey's Energy Master Plan. The NJSEA promotes the reduction of energy consumption through conservation and energy efficiency, and the use of renewable energy resources. As a result, the region will have a more reliable energy system with lower contributions to air pollution. The substantial cost savings to business and industry can fuel economic growth.

The use of renewable energy sources that reduce negative impacts on the natural environment and human health is essential. By adopting energy efficiency technologies and practices, cost savings can be achieved while minimizing adverse impacts to the environment. Through the development process, enormous opportunities abound for applying modern building techniques to new buildings and renovation projects alike. Sustainable practices that decrease the consumption of energy, electricity, and water; reduce the emission of greenhouse gases; boost the re-use of materials; and enhance indoor environmental quality are encouraged.

9. TO DIRECT THE NJSEA'S POLICIES AND PRACTICES TOWARD A SUSTAINABLE MEADOWLANDS.

The concept of sustainability or sustainable development was brought into widespread use by the United Nations' World Commission on Environment and Development in 1987 in a report entitled, "Our Common Future." The report defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."

As a regional planning entity, the NJSEA has the authority to make key decisions and implement policies that affect sustainability on a District-wide basis. Progress toward a sustainable future for the Hackensack Meadowlands District requires a multi-faceted approach. Policies that tie the built environment to the capacity of the land and promote suitable land use patterns sustained by an effective transportation network are the cornerstone principles of this Master Plan.

The foundation of sustainability for the Meadowlands is the preservation and/or restoration of the remaining wetlands in the District. Every remaining parcel of wetlands in the District, in many cases inclusive of adjoining upland areas, incontrovertibly contains value, not only for wildlife habitat, but also for their functionality to accommodate floodwater storage and projected marsh migration.

As we address the sustainability of our built environment, we must also make provisions for green infrastructure and meaningful open spaces.

10. TO PROVIDE EXCELLENCE IN PUBLIC SERVICE.

Interaction with constituents, such as Meadowlands District residents, government officials, business and property owners, environmentalists, developers, and visitors, is part of the NJSEA's daily activities. The NJSEA applies a customer service approach to disseminate information about

our services and products. Main sources of public information include professional staff contacts, the NJSEA website, Geographic Information Systems (GIS), educational programs, press releases, the NJSEA Annual Report, and the ongoing coordination with the municipalities through the HMMC.

In the administration of its regulatory responsibilities, the NJSEA seeks to minimize the public's costs, maximize efficiency, and provide timely responses, while observing the highest ethical standards. The NJSEA rules are rooted in protecting the public health, safety and welfare, and the staff regularly meets with members of the public to provide information about regulations and/or processes in order to streamline and promote predictability about the agency's various review processes.

The NJSEA also continues to contribute to greater economies and efficiencies among constituent municipalities through continuation of value added services, such as the maintenance and operation of an equipment pool.

11. TO DELIVER THE VISION OF THIS MASTER PLAN IN SOLIDARITY WITH OTHER MEADOWLANDS DISTRICT STAKEHOLDERS.

The NJSEA will continue to foster cooperation among the District's many stakeholders: the constituent municipalities; County, State, and Federal officials; the business community; developers; nonprofit organizations; other environmental stewards; higher educational institutions; and private citizens. In some instances, the involvement of local jurisdictions beyond the District borders should be sought to realize common goals.

Since its formation in 1969, the agency has achieved much success in the implementation of its founding mandates, having closed more than 50 orphaned landfills, preserved more than 3,500 acres of environmentally sensitive wetlands, and contributed to the region's remarkable environmental renaissance. The Meadowlands, once scarred by blight and pollution, today is teeming with wildlife and natural beauty, and is a nationally-recognized birding destination.

At the same time, the agency has successfully attracted economic growth to the District, establishing the region as a major economic engine in northern New Jersey. The District is a hub for industrial and commercial development due to the District's prime location within the New York/New Jersey metropolitan area, only 5 miles from New York City, with easy access to major highways, rail, air and sea ports, and mass transportation.

The NJSEA is steadfastly committed to furthering its core mandates within the Hackensack Meadowlands District. This Master Plan sets forth a pathway to continued study of District conditions to ensure the District remains at the forefront of its environmental and economic growth objectives, continuing a half-century's planning legacy and corresponding achievements, detailed in the following "The Meadowlands Plan: A 50-Year Retrospect".



THE MEADOWLANDS PLAN: A 50-YEAR RETROSPECT

The year 2020 marks the 50th anniversary of the first Comprehensive Land Use Plan for the Hackensack Meadowlands District. In recognition of this milestone, the NJSEA has compiled a brief summary of the significant historical District planning initiatives and noteworthy accomplishments achieved by this agency and its predecessors, as they form the foundation of this Master Plan update.

HACKENSACK MEADOWLANDS DISTRICT MASTER PLANS



HACKENSACK MEADOWLANDS RECLAMATION AND DEVELOPMENT ACT (1968)

The Hackensack Meadowlands District was created by an Act of the New Jersey State Legislature in 1968 to control the indiscriminate dumping and rampant, uncoordinated development occurring in the Meadowlands region. Highlights of the 1968 Act, spearheaded by Assemblyman Richard DeKorte and Senator Fairleigh Dickinson, include the assignment of local planning and zoning powers in portions of 14 municipalities in Bergen and Hudson counties to a State agency, the Hackensack Meadowlands Development Commission (HMDC), formed in 1969.

The Act outlined the agency’s founding mandates as follows:

- To protect the delicate balance of nature;
- To provide for orderly development; and
- To provide facilities for the disposal of solid waste.

The legislation also established the Hackensack Meadowlands Municipal Committee (HMMC), a committee consisting of the 14 mayors of each constituent Meadowlands District municipality, which may provide input and wield veto power over certain Authority actions.

This Act also created the Meadowlands Inter-municipal Tax Sharing Fund, instituted in 1973, which established a system of payers and receivers among Meadowlands municipalities, allowing municipalities with a large presence of environmentally-sensitive lands to benefit from development in other parts of the Meadowlands District.

HACKENSACK MEADOWLANDS FIRST STAGE MASTER PLAN (1969)

The First Stage Master Plan for the Meadowlands District, dated November 1969, outlined the complex master plan and regulatory processes to be undertaken during the early days of State regulation. The First Stage Master Plan discussed development issues within the Meadowlands District, and set forth Second Stage Master Plan initiatives, including the creation of several plans, such as a Comprehensive Land Use Plan, District Zoning Regulations, Solid Waste Disposal Plan, and Transportation Plan.

HACKENSACK MEADOWLANDS SUBDIVISION REGULATIONS AND BUILDING CODE (1969)

Resolutions adopting preliminary subdivision requirements and adopting the State of New Jersey's building code were adopted in 1969, while the District's Interim Zoning Regulations were being formulated. The subdivision regulations included provisions for the subdivision of land and the creation of roads and drainage facilities. The resolution adopting the State's building code included procedures for coordinating with constituent municipalities, as well as a specific foundation code taking into consideration the unusual soils conditions and resulting foundation requirements in the District.

HACKENSACK MEADOWLANDS MASTER PLAN INTERIM ZONING REGULATIONS (1970)

The first set of zoning standards for the regulation of development within the Meadowlands District became effective May 1, 1970. The interim regulations were intended to be in effect for a two-year period, instituted to control development while a Master Plan was being formulated to define the future of the Meadowlands. These regulations contained the first Official Zoning Map for the Hackensack Meadowlands District, creating six zones: General Residence (R-1), Office-Residence (R-2), Business Commercial (B-C), Light Industrial (M-1), Heavy Industrial (M-2), and Planning Area (P-A).

HACKENSACK MEADOWLANDS COMPREHENSIVE LAND USE PLAN (1970)

The Hackensack Meadowlands Comprehensive Land Use Plan, dated October 1970, is the first Master Plan created for the Hackensack Meadowlands District, and was adopted in 1972. The Plan included a grand vision for the development of the Meadowlands in large specially-planned area (SPA) developments. New communities and employment centers were envisioned to result in the development of 70,000 new residential units, 10,000 hotel rooms, and 20 million square feet of office space, as well as the conservation of 1,500 acres of marshland. Much of the SPA development was planned on wetlands and landfill areas, and never materialized. Notable locations where some degree of development was achieved include the Harmon Cove townhomes and residential towers within the Island Residential SPA, and the Allied Junction approvals within the Transportation Center SPA. The plan also sought to improve water and air quality in the Meadowlands District.

HACKENSACK MEADOWLANDS SANITARY LANDFILL REGULATIONS (1971)

The 1971 sanitary landfill regulations to control landfill operations were adopted by the HMDC and became the first of their kind in the State of New Jersey.

HACKENSACK MEADOWLANDS DISTRICT REGULATIONS (1972)

The first comprehensive zoning regulations implementing the 1970 Comprehensive Land Use Plan became effective on November 9, 1972. These regulations included the establishment of various zones throughout the District, the incorporation of subdivision regulations, and the provision of a specific set of review procedures for specially planned areas. Notably,



these regulations pre-date the 1975 adoption of the New Jersey Municipal Land Use Law, which does not apply to lands within the Hackensack Meadowlands District.

HACKENSACK MEADOWLANDS SOLID WASTE MANAGEMENT DISTRICT (1976)

The New Jersey Solid Waste Management Act, originally adopted in 1970, was amended to designate the Hackensack Meadowlands District as the state's 22nd Solid Waste Management District, and also designates each of the state's 21 counties as a Solid Waste Management District. The Meadowlands District Solid Waste Management Plan was adopted in 1979.

HACKENSACK MEADOWLANDS TRANSPORTATION STUDY (1978)

The Hackensack Meadowlands Transportation Study, prepared with the Port Authority of New York and New Jersey (PANYNJ), proposed various improvements to the area's transportation network. The study recommended improving connections between area highways and increasing public transportation options among the planned centers in the 1970 Comprehensive Land Use Plan. The study also sought to minimize adverse impacts on the environment, and particularly on air quality.

SPECIAL AREA MANAGEMENT PLAN MEMORANDUM OF UNDERSTANDING (1988)

The HMDC entered into a Memorandum of Understanding with the US Environmental Protection Agency (USEPA), US Army Corps of Engineers (USACE), National Oceanic and Atmospheric Agency (NOAA) and the NJ Department of Environmental Protection (NJDEP) to prepare a Special Area Management Plan (SAMP) pursuant to the federal Clean Water Act (CWA). The effective 1970 Hackensack Meadowlands District Master Plan, which planned development on large swaths of wetlands, was not consistent with federal environmental regulations that were enacted in later years, such as the CWA and the Coastal Zone Management Act (CZMA). The HMDC issued a Draft Environmental Impact Statement regarding the proposed SAMP in 1994. The SAMP was intended to streamline permit review in the Meadowlands District, while establishing stringent wetland protections. This controversial initiative spanned over a decade, until participation in the SAMP by this agency was withdrawn in 2002, and a new policy direction promoting the conservation of remaining wetlands in the District had begun to take root.

HACKENSACK MEADOWLANDS TRANSPORTATION STUDY (1990)

The Hackensack Meadowlands Transportation Study, prepared for the HMDC by Ebasco Services, Inc. in 1990, evaluated the District's transportation network in preparation for a then-forthcoming Master Plan revision. The study developed a Meadowlands Transportation Model; provided recommendations for transportation improvements, including increased public transit; advocated a more compact development pattern within centers; and discussed funding strategies.

FEDERAL EMERGENCY MANAGEMENT AGENCY COMMUNITY RATING SYSTEM (1992)

Participation in the Federal Emergency Management Agency's (FEMA's) voluntary Community Rating System (CRS) program began in 1992, affording property owners located within a FEMA-designated floodplain a discount on insurance premiums as a result of the agency's floodplain planning and management activities. The District currently holds a CRS Class 7 rating, resulting in a 15 percent discount on flood insurance for District property owners.

KEARNY MARSH ACQUISITION (1999)

The HMDC purchased the 316-acre Kearny Freshwater Marsh in 1999, providing permanent preservation of a significant wetlands parcel hosting a diverse ecosystem.

MEADOWLANDS CONSERVATION TRUST (1999)

The Meadowlands Conservation Trust (MCT), an agency in but not of the then-HMDC, was established in 1999. The MCT's mission is to acquire land and permanently preserve wetlands, waterways, and open space in the Hackensack River Watershed.

NEW JERSEY MEADOWLANDS COMMISSION (2001)

The HMDC was renamed the New Jersey Meadowlands Commission in 2001, which, by removing the word "development" from the agency's name, better reflected the agency's role in the region as a State agency and its commitment to the Meadowlands as whole.

NJMC MASTER PLAN AND REGULATIONS (2004)

The NJMC Master Plan was adopted in 2004, representing the first new master plan for the District since 1970. The 2004 Master Plan represented a transformative change in the District's land use policy through the planned preservation of the remaining 8,400 acres of wetlands in the District. Many of these wetlands were located in areas that had previously been zoned for development within specially planned areas. As of 2019, approximately 3,500 acres of the District's wetlands have been preserved.

The District's zoning and subdivision regulations were also completely overhauled in 2004 to implement the policies of the new Master Plan. In order to balance the environmental preservation objectives of the new plan with economic development goals, zoning regulations were revised to permit additional development potential on upland and brownfield areas, and comprehensive redevelopment regulations were codified.

HACKENSACK MEADOWLANDS FLOODPLAIN MANAGEMENT PLAN (2005)

The Hackensack Meadowlands Floodplain Management Plan (FMP) was adopted on October 26, 2005, creating a new mechanism for assessing, identifying, and addressing flood hazards in the District. The plan includes a series of measures to mitigate flood impacts within the District, including flood incident and water level monitoring, drainage system maintenance and improvements, and flood warning systems. Since 2012, the number of repetitive loss properties in the District increased from 10 to 119 properties as a result of the impacts of Superstorm Sandy. The increase in the number of repetitive loss properties necessitates an audit of the NJSEA's FMP every 5 years. The NJSEA is currently developing a new comprehensive FMP, to be finalized by October 2022.

HACKENSACK MEADOWLANDS TRANSPORTATION PLANNING ACT (2005)

The Hackensack Meadowlands Transportation Planning Act established the District as a Transportation Planning District (TPD) in 2005. This Act resulted in the creation of a comprehensive District-wide Transportation Plan in 2007 that identified transportation improvements and funding mechanisms needed to sustain future economic growth. The Transportation Plan authorized the collection of fees on District development projects based upon a technical analysis of their projected impacts upon the transportation system.

The agency was awarded a \$10 million Transportation Investment Generating Economic Recovery (TIGER) grant by the Federal Highway Administration (FHWA) in 2010 to implement the Meadowlands Adaptive Signal System for Traffic Reduction Project (MASSTR). The initiative entailed upgrading 124 signalized intersections throughout the Meadowlands region through an intricate network of technology to continuously adjust traffic signal timings based upon the changing flows of traffic in real-time. MASSTR was the first adaptive signal system of its kind in New Jersey and the largest system to be implemented

at one time in the country, and was the recipient of the Institute of Transportation Engineers (ITE) Metropolitan Section of New York and New Jersey Project of the Year award in 2013.

GREEN BUILDING REGULATIONS (2006)

Green building regulations promoting the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) guidelines were enacted in 2006 to incentivize sustainable development in the District.

In 2008, the NJSEA's Center for Environmental and Scientific Education (Science Center) and William D. McDowell Observatory at DeKorte Park opened to the public. The Science Center is the first public building in New Jersey to achieve LEED Platinum status, the highest rating, from the USGBC.

NJMC ENERGY MASTER PLAN (2008)

The NJMC adopted the first District-specific Energy Master Plan on November 24, 2008. Developed in association with the Center for Energy, Economic & Environmental Policy at the Rutgers Bloustein School of Planning and Public Policy, the plan's goals included maximizing energy conservation and efficiency to reduce energy consumption, and the installation of 20,000 kW of renewable energy in the District by 2020. As of 2019, the NJSEA approved approximately 50,000 kW of photovoltaic installations within the District, far exceeding its 20,000 kW goal.

INTERIM POLICIES GOVERNING AFFORDABLE HOUSING DEVELOPMENT (2008)

The "Interim Policies Governing Affordable Housing Development in the Meadowlands District" (Interim Policies) were adopted July 24, 2008, and last revised July 27, 2011, to facilitate the development of affordable housing in the District. The Interim Policies include a site suitability review procedure wherein sites not zoned for residential use may be deemed suitable sites to accommodate inclusionary housing development based on specific criteria.

HACKENSACK MEADOWLANDS AGENCY CONSOLIDATION ACT (2015)

Legislation signed by Governor Chris Christie in 2015 merged the NJMC with the NJSEA, which assumed the former NJMC's departments and responsibilities, including Land Use Management and Solid Waste and Natural Resources. The core mission and mandates for the Hackensack Meadowlands District remain unchanged by the merger.

HACKENSACK MEADOWLANDS DISTRICT MASTER PLAN (2020)

This Master Plan is intended to serve as an update the 2004 Master Plan, which had described a vision for potential economic development and environmental objectives over the ensuing three decades that remains largely relevant today. This Master Plan will evaluate the existing conditions in the District, discuss significant changes since 2004, and highlight the accomplishments, as well as the challenges, to implementing the vision. This Master Plan will also set forth new policy objectives and provide recommendations for future comprehensive planning studies that will continue to promote the environmental preservation and economic development objectives for the Hackensack Meadowlands District over the next decade.

POPULATION AND ECONOMY

2

2. POPULATION AND ECONOMY

This chapter shall serve as an overview of the Hackensack Meadowlands District’s (District) defining demographic and economic characteristics.

Figure 2.1 “Land within the Hackensack Meadowlands District, by Municipality” identifies the total acreage of each municipality, its portion within the District, and its relative portion of the District’s total acreage. [Map 2 – District Municipalities](#) in the appendices shows the relationships of the constituent municipalities to the District’s boundaries.

Figure 2.1 LAND WITHIN THE HACKENSACK MEADOWLANDS DISTRICT, BY MUNICIPALITY

MUNICIPALITY	TOTAL ACRES	DISTRICT ACRES	% OF MUNICIPALITY	% OF DISTRICT
BERGEN COUNTY				
Carlstadt	2,690	2,307.6	85.7%	11.9%
East Rutherford	2,572	1,940.1	75.4%	10.0%
Little Ferry	1,070	424.6	39.6%	2.2%
Lyndhurst	3,178	1,935.2	60.8%	10.0%
Moonachie	1,115	831.8	74.5%	4.3%
North Arlington	1,619	456.7	28.1%	2.4%
Ridgefield	1,835	987.5	53.7%	5.1%
Rutherford	1,850	570.5	30.8%	2.9%
South Hackensack	476	91.3	19.1%	0.5%
Teterboro	718	483.8	67.4%	2.5%
HUDSON COUNTY				
Jersey City	11,534	937.3	8.1%	4.8%
Kearny	6,520	3,370.9	51.7%	17.4%
North Bergen	3,454	1,313.2	38.0%	6.8%
Secaucus	4,214	3,745.4	88.9%	19.3%
TOTAL	42,845	19,396	45.3%	100.0%

SOURCE: MERI GIS

Since 2004, the NJSEA’s Geographic Information Systems (GIS) service, provided by the Meadowlands Environmental Research Institute (MERI), has converted its platform to utilize the State of New Jersey Geographic Information Network (NJGIN) metadata. This conversion has resulted in some discrepancies in property boundaries between 2004 data and the current system. For example, the calculated number of acres in the District changed from 19,485 acres in 2004 to 19,396 acres, a net difference of approximately 89 acres. Therefore, analyses in this Master Plan that include comparisons to 2004 data inherently do not permit an exact assessment due to this variation in data.

However, along with the challenges resulting from an update in technology came opportunities to further refine the District’s land use data. Advancements in technology have resulted in higher-resolution aerial

mapping, which has enabled a more accurate categorization of land uses in the Meadowlands District, particularly within natural areas.

I. POPULATION

The background information in this section contributes to a baseline from which planning strategies can be devised to guide the future of the District. Established land use patterns and the demographic fundamentals of population, housing, employment and economy are key components of the baseline condition. Shifts in these demographic areas create pressures for changes in land use and contribute towards the development of a framework for the future. Where data specific to the portion of a municipality within the District is not available, it is presented at the municipal, county, or regional level. The demographic and market analyses herein were prepared for the NJSEA by 4ward Planning, Inc.

A. POPULATION CHARACTERISTICS

As of 2018, there are approximately 496,790 residents in the District's 14 municipalities, with 80 percent (395,990 persons) of this population residing in the four municipalities located within Hudson County and 20 percent (100,790 persons) residing in the 10 municipalities located within Bergen County. The actual in-District population is much less due to the relatively small amount of land area occupied by residential uses within the District boundaries. The data is also heavily influenced by the comparatively larger population of Jersey City located outside of the District, with just 8 percent of its land area located inside the District. (See Figure 2.2 "Population of Meadowlands District Municipalities.")

Between 2010 and 2018, the District's municipalities experienced modest population growth, increasing by approximately 42,710 residents (1.2 percent per year). The breakdown by county corresponds with overall population trends in each county. Bergen County grew by 0.6 percent per year from 2010-2018, which matched the growth rate for Bergen in-District municipalities. Hudson County in-District municipalities grew slightly faster at 1.3 percent per year than Hudson County as a whole, at 1.2 percent.

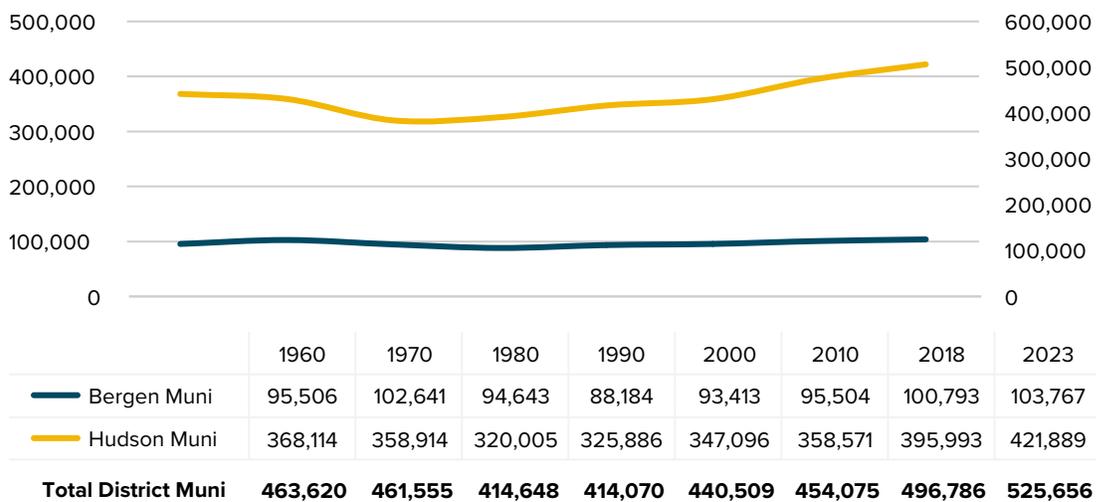
Over the next five years, a continuation of the modest population growth is projected in the District's municipalities, with an increase in population of 28,870 residents (1.2 percent per year) by 2023. The breakdown by county again closely corresponds with overall trends in each county, with Bergen County growth projected at 0.6 percent per year (0.6 percent for Bergen constituent municipalities), and Hudson County's growth projected at 1.1 percent per year (1.3 percent for Hudson constituent municipalities). As noted previously, Jersey City's sizable area outside the District (92 percent) influences the population data. Increases in population in Bergen County, Hudson County, and in the State of New Jersey have been attributed to immigration, the revitalization of urban areas, and sustained economic development in the region. (See Figure 2.3 "Population Changes of Meadowlands District Municipalities.")

Figure 2.2 POPULATION OF MEADOWLANDS DISTRICT MUNICIPALITIES

	1960	1970	1980	1990	2000	2010	2018	2023
Lyndhurst	21,867	22,729	20,326	18,262	19,340	20,539	22,063	22,887
East Rutherford	7,769	8,536	7,849	7,902	8,558	8,908	10,008	10,555
Carlstadt	6,042	6,724	6,166	5,510	5,917	6,127	6,328	6,451
Moonachie	3,052	2,951	2,706	2,817	2,754	2,708	2,749	2,773
Teterboro	22	19	19	22	64	67	67	67
South Hackensack	1,841	2,412	2,229	2,106	2,200	2,378	2,509	2,596
Little Ferry	6,175	9,064	9,399	9,989	10,800	10,621	11,057	11,304
Ridgefield	10,788	11,308	10,294	9,996	10,819	11,026	11,751	12,185
North Arlington	17,477	18,096	16,587	13,790	15,149	15,371	15,739	15,976
Rutherford	20,473	20,802	19,068	17,790	17,812	17,759	18,522	18,973
BERGEN MUNICIPALITIES	95,506	102,641	94,643	88,184	93,413	95,504	100,793	103,767
Jersey City	276,101	260,350	223,532	228,537	236,678	244,754	275,666	296,888
Secaucus	12,154	13,228	13,719	14,061	15,001	15,514	18,289	19,382
North Bergen	42,387	47,751	47,019	48,414	57,424	60,189	62,557	64,607
Kearny	37,472	37,585	35,735	34,874	37,993	38,114	39,481	41,012
HUDSON MUNICIPALITIES	368,114	358,914	320,005	325,886	347,096	358,571	395,993	421,889
Total District Municipalities	463,620	461,555	414,648	414,070	440,509	454,075	496,786	525,656

SOURCE: 4WARD PLANNING, INC. (NJ DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT/ ESRI)

Figure 2.3 POPULATION CHANGES OF MEADOWLANDS DISTRICT MUNICIPALITIES



SOURCE: 4WARD PLANNING, INC. (NJ DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT/ESRI)

Demographic trends, particularly the aging of the Baby Boomers (the generation born between 1946 and 1964), the maturing of the Millennials (the generation born between 1981 and 1996), and immigration will continue to influence economic and housing trends in the coming years.

B. HOUSEHOLD INCOME

Figure 2.4 “Household income Profile (2000-2018)” compares the median household income for Bergen and Hudson Counties with the median income for the State of New Jersey for 2000, 2010, and 2018. It also looks at per capita income for the same timeframes, comparing Bergen and Hudson Counties to the State of New Jersey. This table also details annualized percentage growth of median household income and per capita income from 2000 to 2018.

While Bergen County had the highest median income and per capita income for all timeframes, Hudson County had the highest annualized growth rate for median household income at 3.3 percent per year, as well as per capita income, growing 4.4 percent per year from 2000 to 2018. Bergen County’s median income grew at the same rate as the State, 2.3 percent, from 2000 to 2018. However, the State’s per capita income increased by 2.7 percent per year, while Bergen County’s grew at 2.4 percent per year. These numbers reflect the growth that Hudson County experienced from 2010-2018, a time during which urban areas experienced a surge in population and job growth.

Figure 2.4 HOUSEHOLD INCOME PROFILE (2000-2018)

	2000	2010	2018	CHANGE 2000-2018	ANNUALIZED % GROWTH
MEDIAN HOUSEHOLD INCOME					
Bergen County	\$65,241	\$81,708	\$92,940	\$27,699	2.3%
Hudson County	\$40,293	\$55,275	\$64,510	\$24,217	3.3%
State of New Jersey	\$55,146	\$69,811	\$78,126	\$22,980	2.3%
	2000	2010	2018	CHANGE 2000-2018	ANNUALIZED % GROWTH
PER CAPITA INCOME					
Bergen County	\$33,638	\$42,006	\$48,159	\$14,521	2.4%
Hudson County	\$21,154	\$31,024	\$38,027	\$16,873	4.4%
State of New Jersey	\$27,006	\$34,858	\$40,482	\$13,476	2.7%

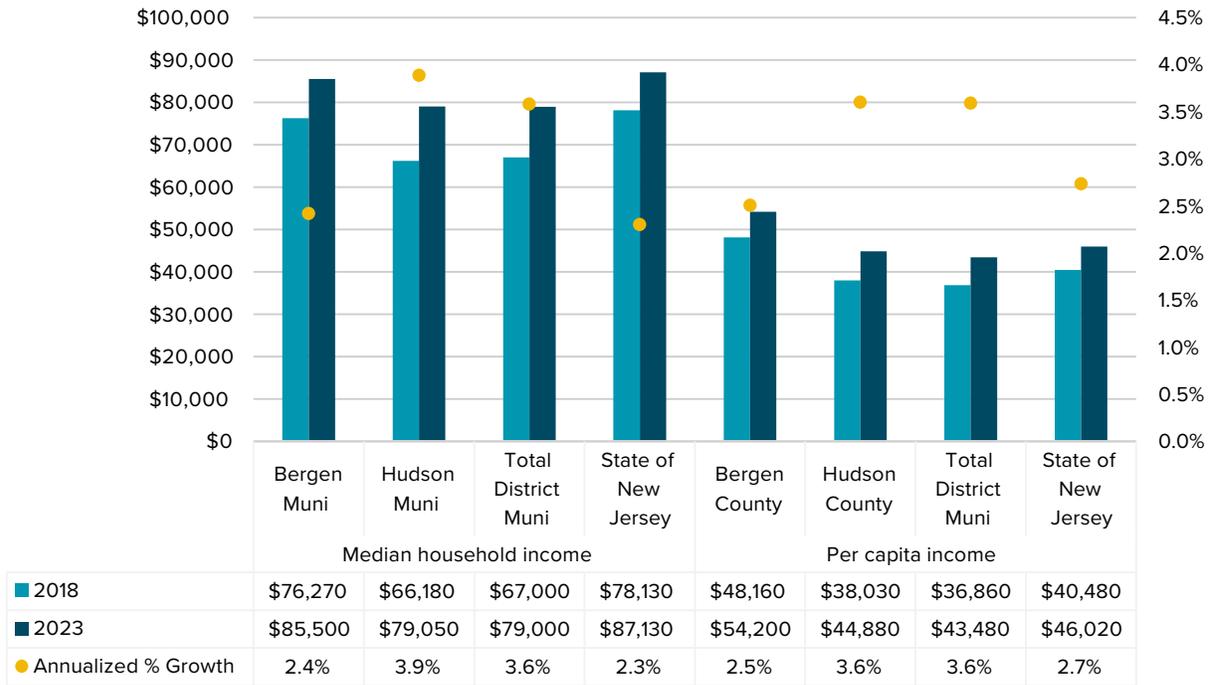
SOURCE: 4WARD PLANNING, INC. / ESRI

Figure 2.5 “Median Household and Per Capita Income (2018 and 2023)” below compares the 2018 median household incomes for Bergen and Hudson County municipalities with the median incomes of the total District municipalities and the State of New Jersey. It also looks at per capita income for the same timeframes, comparing Bergen and Hudson Counties to District municipalities and the State of New Jersey.

As of 2018, both median household and per capita incomes in the District municipalities (\$67,000 and \$36,860, respectively) are lower than those within the State (\$78,130 and \$40,480 respectively). The municipalities located within Bergen County reported a median household income of \$76,270 compared to the municipalities in Hudson County which reported median incomes of \$66,180.

Between 2018 and 2023, median household and per capita income growth in the District municipalities are both expected to increase at a rate of 3.6 percent per year, faster than the same metrics within the State (2.3 and 2.7 percent, respectively). Near-term median household income growth in the District municipalities is expected to be particularly strong among the four municipalities located within Hudson County (growing by 3.9 percent per year).

Figure 2.5 MEDIAN HOUSEHOLD AND PER CAPITA INCOME (2018 AND 2023)



SOURCE: 4WARD PLANNING, INC. / ESRI

C. EDUCATIONAL ATTAINMENT

The District municipalities have a relatively well-educated labor force. Figure 2.6 “Educational Attainment (2010-2018)” below shows the percentages of residents, by county, who have attained various educational levels, with comparisons to the state and the nation. As of 2018, approximately 41 percent of adult residents 25 years of age and older in the District municipalities possessed a bachelor’s degree or higher and 16 percent had obtained a graduate or professional degree, compared to just 32 and 12 percent, respectively, nationally.

The share of educational attainment among adult residents has been increasing in recent years within all geographies examined, but particularly within the District municipalities. For example, while the share of adult residents with a bachelor’s degree or higher within the state and nation increased by nine and eight percentage points, respectively, from 2000 to 2018, the share of adult residents with a bachelor’s degree or higher within the District municipalities increased by 16 percentage points over the same period.

Figure 2.6 EDUCATIONAL ATTAINMENT (2010 – 2018)

	JURISDICTION	2000	2010	2018	CHANGE 2000-2018
HIGH SCHOOL GRADUATE OR HIGHER	Bergen Municipalities	82%	89%	91%	9%
	Hudson Municipalities	72%	82%	86%	14%
	Total District Municipalities	74%	83%	87%	13%
	State of New Jersey	82%	87%	89%	7%
	United States	80%	85%	88%	8%
BACHELOR'S DEGREE OR HIGHER	Bergen Municipalities	26%	33%	40%	14%
	Hudson Municipalities	25%	35%	41%	16%
	Total District Municipalities	25%	34%	41%	16%
	State of New Jersey	30%	35%	39%	9%
	United States	24%	28%	32%	8%
GRADUATE/ PROFESSIONAL DEGREE	Bergen Municipalities	8%	11%	14%	6%
	Hudson Municipalities	9%	13%	16%	7%
	Total District Municipalities	9%	12%	16%	7%
	State of New Jersey	11%	13%	15%	4%
	United States	9%	10%	12%	3%

SOURCE: 4WARD PLANNING, INC. (U.S. CENSUS BUREAU, CENTER FOR ECONOMIC STUDIES)

II. EMPLOYMENT

Data regarding labor force, which measures persons employed and unemployed by place of residence, is provided by the New Jersey Department of Labor and Workforce Development. Bergen and Hudson counties offer Meadowlands employers a sizable labor pool (see Figure 2.7 “Labor Force by Employment Status”). Employers may also draw workers who reside in the nearby New Jersey counties of Essex, Passaic, Union, Morris, and Sussex and the southern counties of New York State.

In 2016, with approximately 394,440 working age persons 16 years and older and 267,210 persons in the labor force (those working and persons who are unemployed but seeking employment), the District municipalities had a participation rate of 67.7 percent and an unemployment rate of 8.2 percent.

While the unemployment rate in District municipalities is 0.9 points lower than it was in 2010 (9.1 percent), it remains higher than the unemployment rate observed within the State (7.9 percent) and higher than the five-percent level generally considered full employment by economists. Furthermore, the participation rate within the District municipalities (the number of people working or actively seeking work as a percentage of the working age population) has declined by 0.1 point, over the same period.

Figure 2.7 LABOR FORCE BY EMPLOYMENT STATUS

	2010				2016				CHANGE 2010-2016	
	POPULATION 16 YEARS AND OLDER	LABOR FORCE	PARTICIPATION RATE	UNEMPLOYMENT RATE	POPULATION 16 YEARS AND OLDER	LABOR FORCE	PARTICIPATION RATE	UNEMPLOYMENT RATE	PARTICIPATION RATE	UNEMPLOYMENT RATE
BERGEN MUNICIPALITIES	78,493	51,426	65.5%	6.6%	82,726	54,585	66.0%	7.0%	0.5%	0.3%
HUDSON MUNICIPALITIES	290,610	199,091	68.5%	9.7%	311,713	212,625	68.2%	8.5%	-0.3%	-1.2%
TOTAL DISTRICT MUNICIPALITIES	369,103	250,517	67.9%	9.1%	394,439	267,211	67.7%	8.2%	-0.1%	-0.9%
STATE OF NEW JERSEY	6,893,087	4,597,689	66.7%	7.8%	7,143,654	4,700,524	65.8%	7.9%	-0.9%	0.1%

SOURCES: 4WARD PLANNING, INC., (U.S. CENSUS BUREAU, 2006-2010 AND AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES, 2012-2016)

According to 2018 data provided by the U.S. Census Bureau’s Center for Economic Studies, illustrated by Figure 2.8 “Paid Employees in Bergen and Hudson Counties by NAICS Code” below, there are approximately 725,800 jobs within Bergen and Hudson Counties, an increase in 13,615 jobs from 2010 (when there were approximately 712,180 jobs). The health care and social assistance sector compose the largest sector by employment share within the two counties (14.5 percent of total jobs).

From 2000 to 2018, the number of jobs within Bergen and Hudson counties decreased by approximately 13,620. An increase in jobs in Bergen County (30,620) over that time period was offset by a decrease in jobs in Hudson County (17,000). During this time period, the nation, including New Jersey, suffered from the Great Recession of 2007-2009, largely fueled by a collapse of the housing market due to sub-prime lending. Since 2013, the regional economy has rebounded.

Figure 2.8

PAID EMPLOYEES IN BERGEN AND HUDSON COUNTIES BY NAICS CODE

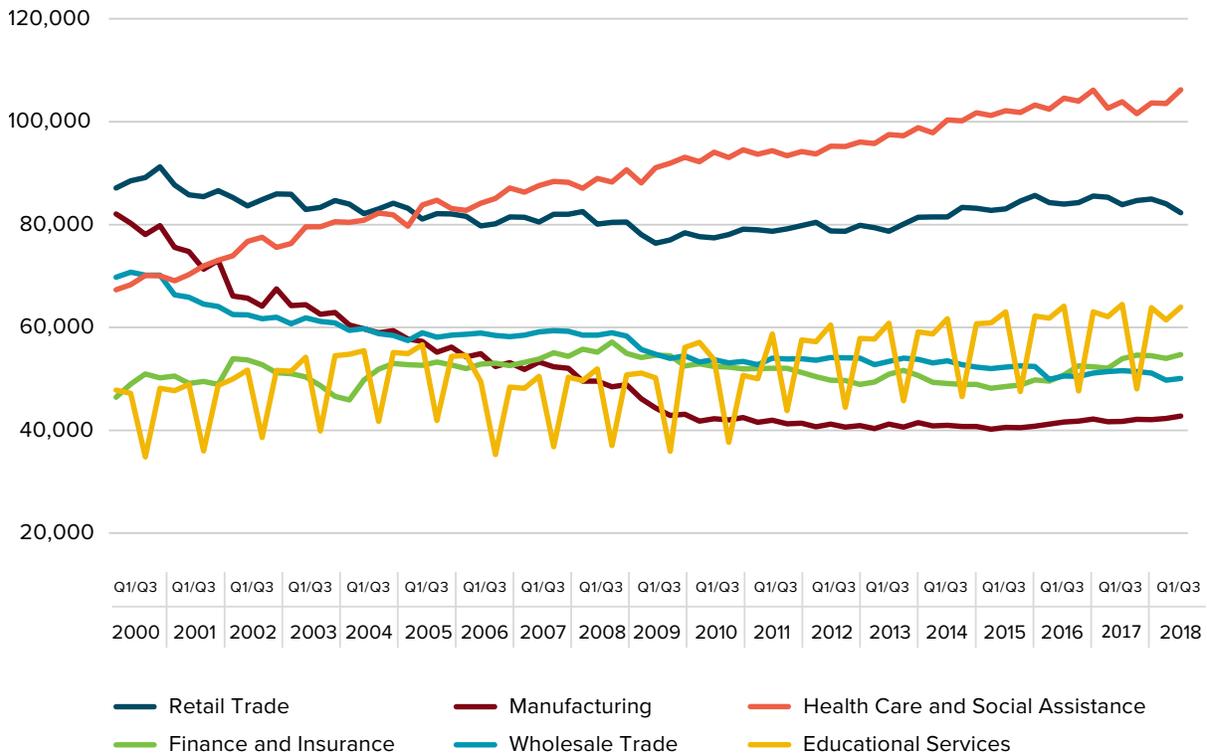
NAICS DESCRIPTION	2000			2018			EMPLOYEE CHANGE (2000-2018)		
	BERGEN COUNTY	HUDSON COUNTY	COMBINED BERGEN & HUDSON	BERGEN COUNTY	HUDSON COUNTY	COMBINED BERGEN & HUDSON	BERGEN COUNTY	HUDSON COUNTY	COMBINED BERGEN & HUDSON
Health Care and Social Assistance	21,628	47,311	68,939	29,467	75,432	104,899	7,840	28,121	35,960
Educational Services	17,676	26,803	44,479	23,861	38,866	62,727	6,186	12,063	18,249
Accommodation and Food Services	10,991	21,629	32,620	18,571	32,215	50,786	7,580	10,586	18,166
Professional, Scientific, and Technical Services	9,963	32,601	42,564	16,239	32,279	48,518	6,275	-322	5,954
Finance and Insurance	28,352	20,770	49,121	40,022	14,330	54,352	11,670	-6,440	5,230
Administrative & Support, Waste Management and Remediation Services	15,600	34,800	50,400	19,003	34,040	53,043	3,403	-760	2,643
Real Estate and Rental and Leasing	4,354	7,573	11,927	5,928	7,972	13,900	1,574	399	1,973
Arts, Entertainment, and Recreation	1,102	8,883	9,985	2,912	8,507	11,419	1,810	-377	1,433
Public Administration	11,970	13,809	25,779	14,360	12,816	27,176	2,390	-994	1,397
Other Services (except Public Administration)	5,591	14,889	20,480	6,056	14,716	20,772	465	-173	292
Management of Companies and Enterprises	3,348	14,870	18,217	3,181	15,326	18,507	-167	457	289
Utilities	1,140	1,362	2,502	1,215	1,490	2,705	75	129	204
Mining, Quarrying, and Oil and Gas Extraction	13	0	13	85	28	113	72	28	100
Agriculture, Forestry, Fishing and Hunting	29	327	356	29	221	250	0	-106	-106
Transportation and Warehousing	26,130	16,024	42,154	25,277	15,955	41,231	-854	-69	-923
Construction	6,800	17,110	23,909	5,092	16,536	21,627	-1,708	-574	-2,282
Retail Trade	26,972	62,043	89,015	28,391	54,797	83,188	1,419	-7,246	-5,827
Information	9,680	19,794	29,474	8,402	9,745	18,147	-1,279	-10,049	-11,328
Wholesale Trade	17,856	52,360	70,216	14,380	35,525	49,904	-3,476	-16,836	-20,312
Manufacturing	22,296	57,738	80,034	9,639	32,900	42,538	12,658	-24,839	-37,496
TOTAL EMPLOYEES	241,488	470,693	712,181	272,104	453,692	725,796	30,616	-17,001	13,615

SOURCE: 4WARD PLANNING, INC. (U.S. CENSUS BUREAU, CENTER FOR ECONOMIC STUDIES, LEHD)

A. COUNTY AND STATE EMPLOYMENT TRENDS

According to 2018 data provided by the U.S. Census Bureau’s Center for Economic Studies (illustrated by Figure 2.9 “Top Six Industries by Total Primary Jobs within Bergen and Hudson Counties”), there are approximately 725,800 jobs within Bergen and Hudson Counties, an increase in 13,615 jobs from 2010 (when there were approximately 712,180 jobs). The health care and social assistance sector compose the largest sector by employment share within the two counties (14.5 percent of total jobs). Over the same period, while the number of jobs within Bergen County increased by 30,620 jobs, the number of jobs within Hudson County decreased by 17,000. With the exception of health care and social assistance jobs and the seasonal fluctuation of educational services, all sectors showed a decrease in jobs starting in 2008, reflecting the Great Recession that had just begun. As of 2018, Manufacturing, Finance and Insurance, and Wholesale Trade had not recovered the lost jobs. Retail jobs have largely recovered.

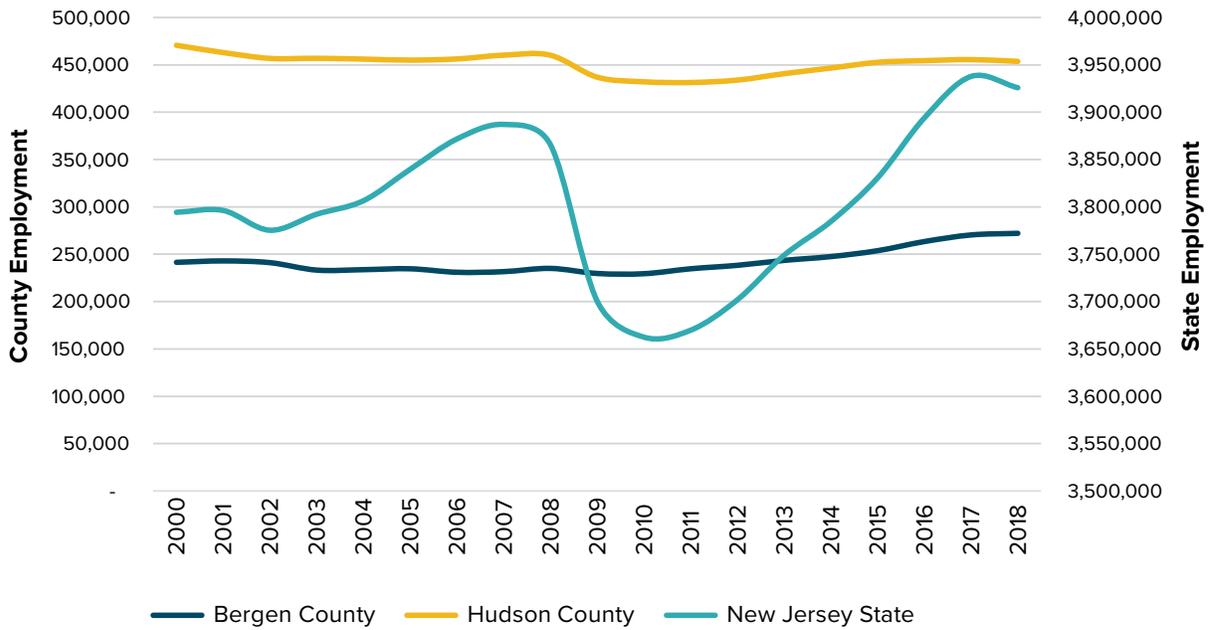
Figure 2.9 TOP INDUSTRIES WITHIN BERGEN AND HUDSON COUNTIES (2000 – 2018)



SOURCE: 4WARD PLANNING, INC. (U.S. CENSUS BUREAU, CENTER FOR ECONOMIC STUDIES)

Figure 2.10 “Employment Trends (2000-2018)” illustrates Bergen and Hudson County employment vs. State of NJ employment. While Bergen County employment as a whole remained relatively stable and saw steady growth, the graph shows that Hudson County employment experienced a dip during the Great Recession in 2008. As of 2018, Hudson County job totals have not risen to pre-Recession levels. The New Jersey curve shows a dramatic increase in the early 2000’s, followed by a dramatic drop in 2008. New Jersey’s 2018 job numbers have surpassed all previous totals.

Figure 2.10 EMPLOYMENT TRENDS (2000 – 2018)



SOURCE: 4WARD PLANNING, INC. (U.S. CENSUS BUREAU, CENTER FOR ECONOMIC STUDIES, LEHD)

III. ECONOMY

According to the Wells Fargo New Jersey Economic Outlook: September 2018, New Jersey’s economy gained momentum going into 2018, as stronger U.S. economic growth has fueled growth in the state’s transportation and distribution sector. Overall employment growth is rising roughly in line with the nation, and the unemployment rate had fallen half a percentage point since the fall of 2017.

New Jersey continues to experience sluggish population growth, with a 0.45% annualized growth rate projected between 2019 and 2024, according to the NJ Department of Labor and Workforce Development. The minor increases in population that New Jersey has seen in recent years are primarily due to immigration. New Jersey continues to lose more than 50,000 residents a year to net domestic migration. With the labor market tightening up, slow population growth will make it harder for New Jersey businesses to find the skilled workers they need, which will increasingly limit job growth. Nonfarm payrolls are expected to rise 1.5 percent in 2019, after a 1.6 percent rise in 2018. The majority of that growth will come from New Jersey’s service sector, particularly healthcare and education.

According to James Hughes of Rutgers University (New Jersey Business, “2019 Industry Forecasts”), three employment sectors will lead the 2019 New Jersey economic expansion. Professional and business services will continue to be a vital engine of growth, along with health services. They will again be joined in 2019 by the trade and transportation sector, as distribution and fulfillment centers continue their rapid growth. Manufacturing will continue to rebound, with 2019 marking its third straight year of employment growth.

Stronger consumer spending and e-commerce-fueled supply chain expansions have strengthened demand for logistics services, warehouses and distribution facilities. This is evident in the District, where e-commerce-related uses continue to grow. Transportation and logistics has long been a key economic

driver in the District and throughout New Jersey. Payrolls in New Jersey’s transportation and warehousing sector have grown faster than any other major sector, accounting for approximately 31 percent of all new jobs created over the past year, and expanding 9 percent year-over-year nearly every month in 2018.

Higher cargo volumes at the Port of New York and New Jersey have bolstered nearby industrial markets in North Jersey, driving demand for warehouses and distribution facilities, and pulling vacancy rates down to near all-time lows. The recent raising of the Bayonne Bridge to accommodate larger post-Panamax container ships should keep cargo volumes growing and continue to attract new investment.

The resurgence in manufacturing activity that began in 2016 is another welcome development and appears to be gaining momentum. Manufacturing employment growth accelerated to 3.4 percent year-to-year in July 2018, on a three-month moving average basis, the fastest rate of growth seen since the 1990’s. Computer and electronic parts, food manufacturing and chemicals have seen notable gains. Manufacturing payrolls are up in every New Jersey metro area, and this improvement is helping to bolster the transportation and logistics sectors.

Access to New York City and Philadelphia remains a key competitive advantage for New Jersey. Increased rail congestion and aging infrastructure, however, have potential ramifications for all New Jersey commuters. The proposed Gateway Program infrastructure improvements are designed to improve service and create capacity to double the number of passenger trains running under the Hudson River. Updates to tracks, bridges, stations and tunnels will ultimately create four mainline tracks between Newark and Penn Station, New York. The multiple levels of public funding needed to fund this ambitious project have added to its complexity, and its future remains uncertain.

Tax revenues have not recovered as quickly as originally anticipated, given the subdued nature of the state’s economic recovery. In response, the state’s already high tax burden was recently raised even further. Legislators passed a new budget agreement that increased the corporate business tax to 11.5 percent, the second highest in the country.

Tax reform at the federal level may also hinder New Jersey’s housing market. The cap of \$10,000 on state and local tax (SALT) deductions enacted under the federal 2017 Tax Cuts and Jobs Act may negatively impact home sales and price appreciation of homes more than what would have otherwise occurred. Over 40 percent of New Jersey residents claim a SALT deduction, at an average amount of \$17,850, which provides some relief from the high property taxes in the state.

The lowering of the mortgage limit for the mortgage interest deduction from \$1 million to \$750,000 enacted under the Tax Cuts and Jobs Act may also have a negative impact on home sales and appreciation of home prices. Given the high concentration of homes in the price range of \$750,000 to \$1.5 million, the Garden State’s housing market may be particularly impacted. These limitations may induce residents to relocate and exacerbate New Jersey’s current demographic losses.

A. ECONOMIC INDICATORS

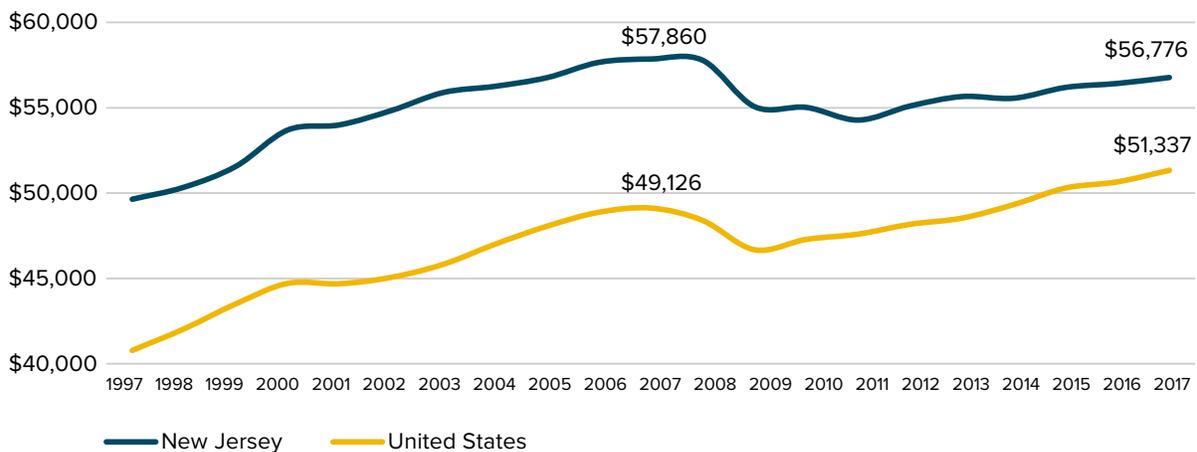
The United States Census Bureau conducts the Economic Census every five years (in years ending in “2” and “7”). The Economic Census is the official measure of the Nation’s businesses and economy. Economic Census data is used as the statistical benchmark for current economic activity such as the Gross Domestic Product and the Producer Price Index. Comprehensive information is generated for nearly one thousand industries and thousands of geographic areas. Information collected from individual businesses includes location, type of business, employment, payroll, and revenue by type

of service or product. Gross Domestic Product (GDP) and the Consumer Price Index (CPI) are two of the most important aspects of a healthy economy. CPI measures inflation and GDP measures the monetary value of all final goods and services produced. The GDP excludes imports, while the CPI includes anything purchased by consumers, including foreign goods.

Real Gross Domestic Product (GDP) per capita is a measurement of all economic activity (e.g. personal consumption, business investment, government spending, and net exports) of a given area adjusted for inflation and divided by the number of people. The data is compiled and analyzed by the United States Bureau of Economic Analysis (BEA) and results are released quarterly. According to BEA data, in 2017, New Jersey’s per capita Real GDP amounted to \$56,776 in 2009 dollars.

As shown in Figure 2.11 “Per Capita Real GDP (Chained 2009 Dollars),” while New Jersey’s Real GDP per capita is currently \$5,440 higher than that within the nation (\$51,337), overall, it remains \$1,085 lower than it was in 2007 (\$57,860).

Figure 2.11 REAL GDP (CHAINED 2009 DOLLARS)*



*Chained dollars is a method of adjusting real dollar amounts for inflation over time, so as to allow comparison of figures from different years. The U.S. Department of Commerce introduced the chained-dollar measure in 1996. Chained dollars generally reflect dollar figures computed with 2009 as the base year (Wikipedia).

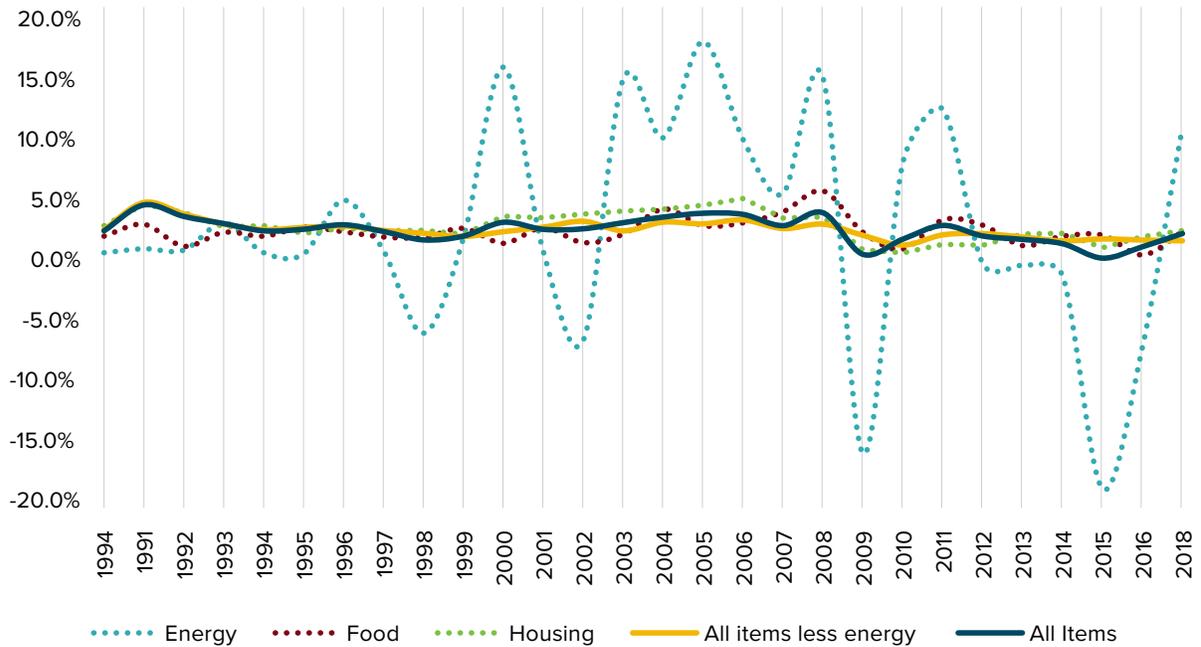
SOURCE: 4WARD PLANNING, INC. (UNITED STATES BUREAU OF ECONOMIC ANALYSIS)

The CPI is a measure of the average change in prices over time in a fixed market basket of goods and services (e.g. energy, food, housing, etc.). This data is compiled by the United States Bureau of Labor Statistics (BLS) and is released monthly. According to the BLS, the CPI is the most widely used measure of inflation and is sometimes viewed as an indicator of the effectiveness of government economic policy. When wages and salaries fail to keep up with increases in the CPI, the buying power of consumers is diminished. Per Figure 2.12 “Year Over Year Percent Changes in CPI-U for Urban Consumers: New York MSA,” as of May 2018, the all items CPI Index for All Urban Consumers (CPI-U) in the New York Metropolitan Statistical Area (MSA) increased by 2.2 percent over the previous year (compared to a 2.8 percent increase within the nation).

In comparison, the index for all items less energy (a typically less volatile index which excludes prices for household and transportation fuels) in the New York MSA increased by 1.6 percent over the previous year (compared to a 2.1 percent increase within the nation).

Figure 2.12

**YEAR OVER YEAR PERCENT CHANGES IN CPI-U FOR URBAN CONSUMERS:
NEW YORK MSA****



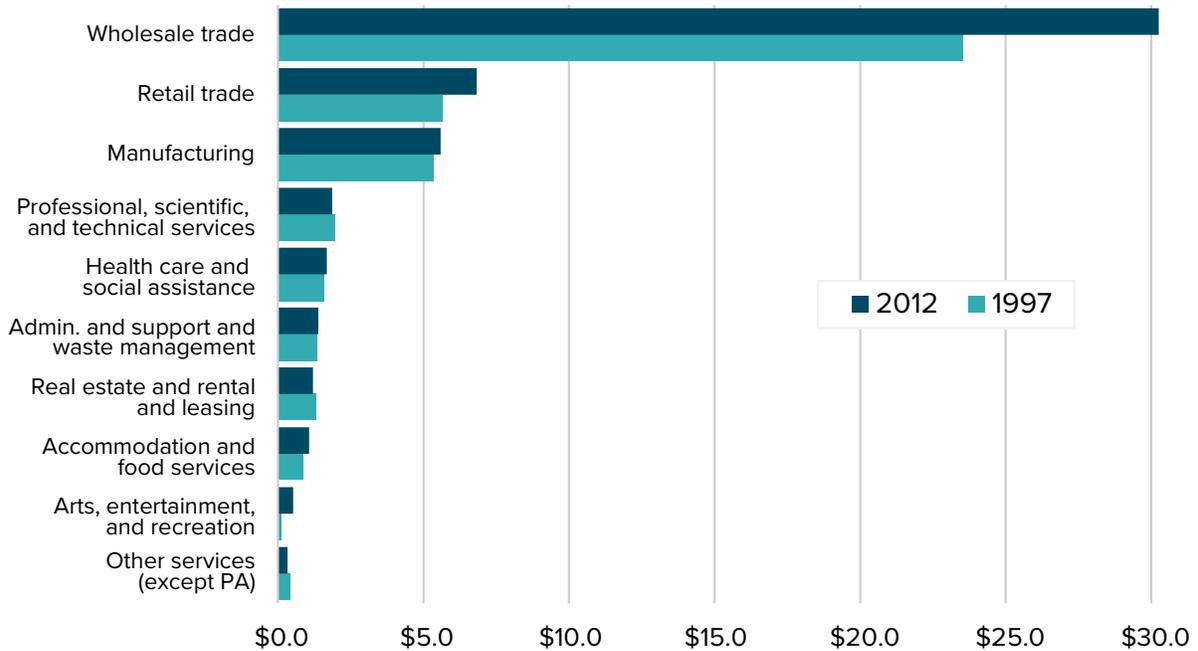
**The New York-Newark-Jersey City, N.Y.-N.J.-Pa., Core Based Statistical Area includes Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, and Westchester Counties in New York; Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, and Union Counties in New Jersey; and Pike County in Pennsylvania.

SOURCE: 4WARD PLANNING, INC. (U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, INCLUDES ALL ITEMS NOT SEASONALLY ADJUSTED, AS OF MAY 2018)

The Employer Value of Sales, Shipments, Receipts, Revenue, or Business is also generated by Economic Census data (see Figure 2.13 “Employer Value of Sales, Shipments, Receipts, Revenue or Business Done in District Municipalities”). In 2012 (the year of the latest available Economic Census data), District municipalities had nearly \$51 million in employer sales, shipments, receipts, revenue, or business done by domestic establishments (excludes foreign subsidiaries), with 60 percent of this value (nearly \$30.3 million) occurring within the wholesale trade sector. Furthermore, 70 percent of the District municipalities’ employer sales, shipments, receipts, revenue, or business (nearly \$36 million) is occurring within Hudson County municipalities.

From 2007 to 2012, employer sales, shipments, receipts, revenue, or business done within the District municipalities increased by 20 percent (by \$42.2 million or 1.4 percent per year), with employer sales, shipments, receipts, revenue, or business increasing in Hudson County municipalities (3.0 percent per year) but decreasing within Bergen County municipalities (-1.0 percent per year).

Figure 2.13 EMPLOYER VALUE OF SALES, SHIPMENTS, RECEIPTS, REVENUE, OR BUSINESS DONE IN DISTRICT MUNICIPALITIES (MILLIONS OF DOLLARS)



SOURCE: 4WARD PLANNING, INC. (US BUREAU OF THE CENSUS, 1997 AND 2012 ECONOMIC CENSUS)

IV. REAL ESTATE TRENDS

A. INDUSTRIAL MARKET

Cushman and Wakefield prepares market trend reports for a number of local markets, including Northern New Jersey. According to first-quarter 2018 data, provided in Figure 2.14 “Industrial Market Inventory, Lease and Vacancy Rates,” there is nearly 160 million square feet of industrial space (including high-tech, manufacturing, and warehouse/distribution space) within Bergen and Hudson Counties combined, with 4.5 percent of this space currently vacant (7.1 million square feet).

From the first quarter of 2012 through the first quarter of 2018, the total square footage of industrial space in the combined two-county region remained relatively flat (increasing by just 3.6 million square feet or 0.4 percent per year), while the average vacancy rate declined sharply (by 5.7 percentage points). During the same period, asking rents for warehouse/distribution space rose significantly within both Bergen County (by \$3.04 per square foot) and Hudson County (by \$3.38 per square foot).

Figure 2.14 PAID EMPLOYEES IN BERGEN AND HUDSON COUNTIES BY NAICS CODE

COUNTY	1ST QTR. 2012	1ST QTR. 2013	4TH QTR. 2014	1ST QTR. 2016	1ST QTR. 2018	2012-2018 CHANGE
TOTAL INVENTORY (SF)						
Bergen County	86,380,628	86,453,644	86,889,387	86,489,616	86,529,265	148,637
Hudson County	69,948,294	70,595,608	72,942,755	73,674,849	73,454,136	3,505,842
Total	156,328,922	157,049,252	159,832,142	160,164,465	159,983,401	3,654,479
Northern New Jersey	284,538,379	285,695,117	289,371,238	289,024,393	285,915,667	1,377,288
OVERALL VACANCY RATE						
Bergen County	11.2%	10.3%	7.1%	5.9%	4.7%	-6.5%
Hudson County	9.0%	8.8%	9.3%	4.8%	4.2%	-4.8%
Total	10.2%	9.6%	8.1%	5.4%	4.5%	-5.7%
Northern New Jersey	10.3%	9.3%	7.5%	5.9%	6.2%	-4.1%
DIRECT WEIGHTED AVERAGE NET RENTAL RATE						
Bergen County						
High Tech	\$10.15	\$10.74	\$10.67	\$10.97	\$10.20	\$0.05
Manufacturing	\$5.22	\$4.74	\$6.62	\$6.75	\$7.06	\$1.84
Warehouse/ Distribution	\$5.68	\$5.92	\$6.50	\$7.72	\$8.72	\$3.04
Hudson County						
High Tech	\$17.19	\$17.19	NA	\$14.32	\$14.19	-\$3.00
Manufacturing	\$4.57	\$4.45	NA	\$5.40	\$5.40	\$0.83
Warehouse/ Distribution	\$5.87	\$6.17	\$5.97	\$7.74	\$9.25	\$3.38

SOURCE: 4WARD PLANNING, INC., CUSHMAN & WAKEFIELD, MARKETBEAT: NORTHERN & CENTRAL NEW JERSEY

B. OFFICE MARKET

According to second-quarter 2018 data provided by Cushman & Wakefield, provided in Figure 2.15 “Office Market Inventory, Lease and Vacancy Rates,” there is over 6.6 million square feet of office space within the Meadowlands office submarket, with 18.2 percent of this space currently vacant (1.2 million square feet). The Meadowlands office submarket consists of nine municipalities (Carlstadt, East Rutherford, Hasbrouck Heights, Lyndhurst, Rutherford, Teterboro, North Bergen, Secaucus and Union City), seven of which are constituent District municipalities that have portions of their land areas within the District.

From the second quarter of 2012 through the second quarter of 2018, the total square footage of office space in the submarket decreased by 408,900 square feet (1.0 percent per year). During the same period, while average vacancy rates decreased significantly (by 6.0 percentage points), they

remained generally higher than vacancy rates in the combined two-county region. Furthermore, over the same six-year period, asking rents remained relatively flat within the submarket (just over \$24 per square foot for all classes of office space) and generally lower than office rents in the region.

Figure 2.15 OFFICE MARKET INVENTORY, LEASE AND VACANCY RATES

COUNTY	2ND QTR. 2012	4TH QTR. 2015	3RD QTR. 2016	4TH QTR. 2017	2ND QTR. 2018	2012-2018 CHANGE
TOTAL INVENTORY (SF)						
Meadowlands	7,052,622	6,643,698	6,643,718	6,643,718	6,643,718	-408,904
Bergen County	26,175,579	26,503,762	25,911,015	26,025,548	25,978,970	-196,609
Hudson County	23,896,786	24,892,643	24,657,469	24,606,797	24,606,797	710,011
Total	50,072,365	51,396,405	50,568,484	50,632,345	50,585,767	513,402
Northern New Jersey	108,523,931	111,075,521	109,975,844	110,233,260	108,794,140	270,209
OVERALL VACANCY RATE						
Meadowlands	24.2%	21.7%	17.8%	20.7%	18.2%	-6.0%
Bergen County	18.1%	18.4%	17.9%	18.0%	17.8%	-0.3%
Hudson County	8.9%	14.5%	12.8%	16.0%	15.3%	6.4%
Total	13.7%	16.5%	15.4%	17.0%	16.6%	2.9%
Northern New Jersey	17.9%	23.2%	18.8%	18.4%	19.8%	1.9%
ASKING LEASE RATE (PER SF) ALL CLASSES						
Meadowlands	\$24.51	\$25.94	\$24.33	\$24.81	\$24.38	-\$0.13
Bergen County	\$25.99	\$24.62	\$26.57	\$27.13	\$28.99	\$3.00
Hudson County	\$28.60	\$34.51	\$35.63	\$40.18	\$45.28	\$16.68
Northern New Jersey	\$25.36	\$20.84	\$27.94	\$29.84	\$35.48	\$10.12

SOURCE: 4WARD PLANNING, INC. (CUSHMAN & WAKEFIELD, MARKETBEAT: NORTHERN & CENTRAL NEW JERSEY)

Additional detail regarding development activity and land use trends in the District is provided in [Chapter 3 – Land Use](#).

V. STATE OF NEW JERSEY ECONOMIC DEVELOPMENT INCENTIVES

The State of New Jersey offers many programs to assist businesses of all types and sizes. The New Jersey Business Action Center (NJBAC) is a business advocacy team within the New Jersey Department of State (NJDOS) that serves as the “one stop” resource for all business-related services. The State of New Jersey Business Portal at <https://www.nj.gov/njbusiness/> offers a multitude of information for business owners and employees. Several of the many financial incentive programs offered by the State in certain areas of the

District are highlighted below:

A. OPPORTUNITY ZONES

The Opportunity Zones program was enacted as part of the federal Tax Cuts and Jobs Act of 2017 and is administered by the New Jersey Department of Community Affairs (DCA). The program was designed to spur economic development and job creation in economically distressed communities through tax benefits to private investors in Qualified Opportunity Funds. Qualified Opportunity Funds are investment vehicles that are set up to invest in eligible properties in Qualified Opportunity Zones. A total of 169 census tracts have been designated as Opportunity Zones throughout New Jersey. There are four Opportunity Zone census tracts that are located in the District, one in Teterboro, one in Kearny, and two in North Bergen.

B. URBAN ENTERPRISE ZONE PROGRAM

The Urban Enterprise Zone (UEZ) Program, enacted in 1983 and administered by the New Jersey DCA, is an economic development program designed to encourage businesses to locate and create jobs in designated urban communities. Tax and financial incentives available through the UEZ program include the ability to reduce the standard sales tax rate charged to consumers (3.3125 percent effective January 1, 2018), tax credits for certain investments, and one-time tax credits for full-time, permanent employees. There are 32 active zones in 37 municipalities in New Jersey. In the District, zones are located in Kearny, North Bergen and Jersey City in Hudson County.

C. GROW NJ

Grow NJ is a job creation and retention incentive program administered by the New Jersey Economic Development Authority (NJEDA). Grow NJ offers tax credits for employers that create or retain jobs in eligible project locations throughout the State.

D. ECONOMIC DEVELOPMENT AND GROWTH PROGRAM

The Economic Development and Growth (ERG) program is an NJEDA incentive grant program for developers and businesses to address revenue gaps in proposed development projects. The funding is available for residential, commercial, and mixed-use parking projects in eligible project locations.

E. FILM AND DIGITAL MEDIA TAX CREDIT PROGRAM

The Film and Digital Media Tax Credit Program was established to encourage production companies to film and create digital content in New Jersey. The program, administered by the NJEDA, provides tax credits for certain costs incurred during production of films and digital content.

F. BROWNFIELDS PROGRAMS

Given the extensive history of environmental degradation within the Meadowlands, it is not surprising that certain properties remain idle or underutilized. These sites may contain factories, warehouses, landfills, former service stations, or other facilities. Such sites may be deemed in need of redevelopment.

The Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:10B-1 et seq.) defines brownfields as any former or current commercial or industrial sites, currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant.

The State of New Jersey offers a plethora of resources to municipalities, property owners, and prospective developers of brownfields in the State. Several New Jersey State agencies offer regulatory and financial assistance to those interested in developing brownfield sites, including the following:

1. HAZARDOUS DISCHARGE SITE REMEDIATION FUND

The Hazardous Discharge Site Remediation Fund (HDSRF) provides loans and/or grants to parties that remediate and/or clean up contaminated and underutilized sites. This program is administered jointly by the NJEDA and the New Jersey Department of Environmental Protection (NJDEP).

2. THE NEW JERSEY BROWNFIELDS REDEVELOPMENT TASK FORCE

The New Jersey Brownfields Redevelopment Task Force (Task Force) was created in 1998 under Section 5 of the New Jersey Brownfield and Contaminated Site Remediation Act (N.J.S.A. 48:10B-23). The 13-member Task Force consists of seven representatives from the State agencies and six public members. The Task Force, with the support of its Brownfields Redevelopment InterAgency Team (BRIT), coordinates State policy on brownfields. The BRIT is comprised of representatives from NJ State agencies and programs, and is responsible for streamlining the redevelopment process, promoting communication between the State, municipality and developer, and conducting outreach to brownfields stakeholders. The BRIT also produces the “New Jersey Brownfields Redevelopment Resource Kit,” a guide to the NJ State agencies involved in brownfields redevelopment.

The Task Force is also required to prepare an inventory of Brownfield sites in the State and actively market these sites to prospective developers. The inventory is called the NJ Brownfields Site Mart (<https://www.njbrownfieldsproperties.com>).

According to the NJ Brownfields SiteMart, the website serves as:

- A multiple listing service for prospective buyers/developers;
- An important planning tool for municipalities, counties, regional entities and state agencies;
- An archive for Brownfields redevelopment successes;
- A tool for verifying site status as a Brownfields for certain incentives offered by state agencies; and
- A link to multiple additional sources of Brownfields information.

3. NEW JERSEY BROWNFIELDS INTERAGENCY WORKING GROUP (IAWG)

Recognizing the role that Federal agencies often play in the brownfields redevelopment, the NJBAC’s Office for Planning Advocacy (within the NJDOS) has partnered with the United States Environmental Protection Agency (US EPA) Region II Brownfields Program, the NJDEP, and the Center for Creative Land Recycling (CCLR) to form the New Jersey Brownfields InterAgency Working Group (IAWG). CCLR is a national non-profit whose focus is the cleanup and reuse of brownfields. CCLR serves as the USEPA’s Technical Assistance to Brownfield Communities (TAB) provider in several states, including New Jersey.

Using a proactive team approach, the IAWG offers assistance, guidance and resources to municipalities and any their redevelopment partners as they navigate the process to assess, remediate and redevelop Brownfields. The IAWG is made up of State and Federal agencies whose mission is to support the State of New Jersey’s Brownfields redevelopment policies and the USEPA’s Brownfields Economic Development Initiative.

LAND USE

3

3. LAND USE

The Land Use element of the 2020 Master Plan update provides an analysis of land use patterns in the Hackensack Meadowlands District through April 2019. The NJSEA has undertaken a review of the existing land usage in the District in order to evaluate significant changes in land use patterns since 2004. This analysis lays the groundwork for the formulation of an updated Land Use Plan and, ultimately, amended District Zoning Regulations.

I. EXISTING LAND USES

Land uses in the District reflect development existing prior to 1970 as well as those developed under the District's regulations. Established land use patterns are, in many places, the result of historic indiscriminate dumping and unregulated landfilling practices that have heavily influenced the location, type, and intensity of land usage in the District. The categorization of the District's lands provides the basis for identifying existing development patterns, evaluating trends over time, and formulating a plan for the implementation of a desired array of land uses for the future.



PHOTO COURTESY OF M.E. RAINE

The following 16 categories describe the various land use classifications in this Master Plan update:

- **ALTERED LAND** includes areas that have been changed due to these human activities: solid waste disposal areas, dredge material disposal, stone quarries, sand and gravel pits, other extractive mining, and abandoned mining sites.
- **COMMERCIAL OFFICES** house administrative and support staff for large corporations or small businesses, including professional offices. They do not provide goods and services for direct consumer use. Commercial office parks, consisting of several commercial office buildings that exist together and share common driveways, parking lots and lawns, are included in this category. Buildings consist of single buildings or clusters of buildings that are not part of a commercial strip or a well-defined central business district. Accessory office space is classified according to the dominant land use of the property, and is not included in this category.
- **COMMERCIAL RETAIL** contains structures predominantly used for the direct sale of products and services to the consumer. The main building, secondary structures and supporting areas such as parking lots, driveways, and landscaped areas are also included. This category includes retail, dining, personal service, urgent care clinics, and day care facilities, but excludes hotels and motels and mixed commercial/industrial facilities, which appear in different categories herein. Auto repair facilities, previously classified as a retail use, have been reclassified within the Industrial land use category.

- **HOTELS AND MOTELS** contain over-night accommodations. They may also contain related amenities, such as dining facilities, services and recreational activities. Amenities such as tennis courts and pools are included with the hotel or motel category since they are private and not accessible to non-paying guests; these uses are not categorized separately as recreational land.
- **INDUSTRIAL** uses are comprised of land uses where manufacturing, assembly or processing of products, or warehousing and distribution takes place. Light industrial, heavy industrial, bus and truck terminals, and auto and truck repair facilities are included. Power generation has been reclassified within the Utilities category.
- **INDUSTRIAL & COMMERCIAL COMPLEXES** include industrial and commercial facilities where both classifications of uses are present and typically occur together or in close proximity, which may include a mix of light manufacturing; administration offices; research and development facilities; computer systems companies; and facilities for warehousing, wholesaling, retailing and distributing. No heavy industries are present. Many facilities within this category provide retail sales of products stored and/or manufactured within the industrial portion of the building.
- **MEADOWLANDS SPORTS COMPLEX** contains the Meadowlands Sports Complex properties, including the American Dream Meadowlands site, MetLife Stadium, and the Meadowlands Racetrack, but excluding the area containing Walden Swamp, which is included under the Wetlands category. Although these properties are located within District boundaries and classified within this Master Plan and on land use maps, this Master Plan does not apply to the Meadowlands Sports Complex site, pursuant to N.J.S.A. 5:10A-10. Lands within this classification are owned by the NJSEA and are exempt from District zoning regulations.
- **PUBLIC/QUASI-PUBLIC SERVICES** are owned by governmental agencies or quasi-public entities. Uses are intended to serve the public and include post offices, public and private educational institutions at all levels, municipal buildings and other government centers, hospital and other major health institutions providing direct health care to the public (excluding urgent care clinics and doctor's offices), correctional institutions, military installations, religious institutions, research facilities, social clubs associated with established organizations, and cemeteries. Transportation, communication, utility, and recreational facilities are excluded from this category, even where the owner is a public or quasi-public entity.
- **RECREATIONAL LAND** consists of areas that have been specifically developed for recreational activities open to the general public. This use includes golf courses, picnic areas, marina and boat launches, community recreation areas, parks, swimming pools and beaches, formal lawns, arboretums and landscaped areas, stadiums, cultural centers, zoos, and the Meadowlands Sports Complex properties, excluding the American Dream Meadowlands site. Such uses that are not open to the general public are classified as commercial uses.
- **RESIDENTIAL** includes all dwelling types, including single-family residences, multiple-unit dwellings, mobile homes, and other miscellaneous residential types. Residential areas that are integral but minor parts of other land uses are included in the dominant land use category.
- **TRANSITIONAL LAND** includes previously developed but inactive properties, properties undergoing preparation for development or redevelopment, and/or properties pending construction pursuant to permit applications or approvals. This category is a new classification in this Master Plan to address properties that are undergoing development and/or in the process of transition from one land use to another.

- **TRANSPORTATION** includes transportation routes, railroad facilities, park-and-ride lots, airports, and port facilities. Bus garages and truck terminals have been reclassified as industrial uses in this Master Plan update.
- **UTILITIES** include power generating stations; the course of transmission lines; cell towers and antennas; water treatment facilities; sewage treatment facilities; radio, radar, and television antennas; microwave stations; power lines; power substations; and water towers. Towers include the land enclosed by guide wires.
- **VACANT LAND** consists of undeveloped, open areas that are not associated with active uses, have no indication of past activities, no apparent site preparation, and no active development.
- **WATER** includes all areas periodically water covered, except areas in an obvious state of flood. Examples are streams, rivers, creeks, canals and other linear water bodies; lakes (both artificial and natural); reservoirs; bays; and, estuaries. Some areas designated as water existing on a defined tax parcel (i.e., containing a block and lot designation) have been reclassified as wetlands.
- **WETLANDS** are those areas that are inundated or saturated by surface or ground water, either permanently or at varying durations throughout the year, including areas supporting vegetation, organisms, and wildlife adapted for life in saturated soil conditions. This classification has been updated to include properties, such as tidal mudflats, previously classified as water in 2004. Significant drainage facilities are also included in this classification.
- Figure 3.1 “Existing Land Uses within the Hackensack Meadowlands District” summarizes each land use classification by its approximate acreage and percent of the District’s total land area. The Existing Land Use Map showing the location and arrangement of land uses in the District can be found in the appendices as [Map 3 – Existing Land Use](#).

Figure 3.1 EXISTING LAND USES WITHIN THE HACKENSACK MEADOWLANDS DISTRICT

CATEGORY	ACRES	PERCENT
Wetlands	6,213.2	32.0%
Transportation	3,974.4	20.5%
Industrial	3,149.9	16.2%
Water	1,397.5	7.2%
Altered Land	1,067.6	5.5%
Transitional Lands	748.7	3.9%
Utilities	580.3	3.0%
Meadowlands Sports Complex	580.0	3.0%
Residential	400.6	2.1%
Public/Quasi Public Services	335.2	1.7%
Commercial Retail	286.6	1.5%
Recreational Land	190.1	1.0%
Commercial Office	164.2	0.8%
Industrial & Commercial Complex	163.0	0.8%
Hotels and Motels	86.9	0.4%
Vacant Land	57.7	0.3%
TOTAL ACRES	19,396.0	100.0%

SOURCES: MERI GIS AND NJSEA STAFF INSPECTIONS

II. LAND USE TRENDS

The NJSEA staff has analyzed changes in the District’s land use that have occurred since the adoption of the 2004 Master Plan, and has identified some notable changes that have occurred over this time period. The change in the acres and percentage of land occupied by the various land uses is portrayed in Figure 3.2 “Land Use Changes within the District Since 2004.”

District land uses can be classified within three broadly defined areas, as follows:

- **NATURAL AREAS** consist of the District’s waterways, wetland areas, and parklands. Properties classified as Natural Areas are categorized as Wetlands, Water, and Recreational Land;
- **DEVELOPED AREAS** consist of lands improved with buildings, pavement, or other structures, and include the Residential, Commercial Office, Commercial Retail, Hotels and Motels, Industrial, Industrial/Commercial Complex, Meadowlands Sports Complex, Public/Quasi Public Services, Transportation, and Utility categories; and
- **OTHER AREAS** consist of lands that cannot be classified as either a Natural or Developed Area, and include the Vacant Land, Altered Land, and Transitional Land categories.

Figure 3.2 LAND USE CHANGES WITHIN THE DISTRICT SINCE 2004

CATEGORY	LAND USE	2004 ACRES	2004 PERCENT	2018 ACRES	2018 PERCENT	CHANGE (ACRES)
NATURAL AREAS	Wetlands	5,783.6	29.7%	6,213.2	32.0%	429.6
	Water	1,869.7	9.6%	1,397.5	7.2%	-472.2
	Recreational Land	756.6	3.9%	190.1	1.0%	-566.5
DEVELOPED AREAS	Transportation	4,018.4	20.6%	3,974.4	20.5%	-44.0
	Industrial	2,793.3	14.3%	3,149.9	16.2%	356.6
	Utilities	261.5	1.3%	580.3	3.0%	318.8
	Meadowlands Sports Complex	-	0.0%	580.0	3.0%	580.0
	Residential	291.4	1.5%	400.6	2.1%	109.2
	Public/Quasi-Public Services	965.0	5.0%	335.2	1.7%	-629.8
	Commercial Retail	231.4	1.2%	286.6	1.5%	55.2
	Commercial Office	209.8	1.1%	164.2	0.8%	-45.6
	Industrial & Commercial Complex	419.7	2.2%	163.0	0.8%	-256.7
Hotels and Motels	80.7	0.4%	86.9	0.4%	6.2	
OTHER AREAS	Altered Land	1,444.0	7.4%	1,067.6	5.5%	-376.4
	Transitional Land	-	0.0%	748.7	3.9%	748.7
	Vacant Land	360.4	1.8%	57.7	0.3%	-302.7
TOTAL ACRES		19,485.4	100.0%	19,396.0	100.0%	-89.4

SOURCE: MERI GIS

As noted in Chapter 2, changes to the MERI GIS platform do not permit an exact comparison of conditions since 2004. For example, the total number of acres in the District varies in size, from approximately 19,485 acres in 2004 to 19,396 acres as determined by current GIS metadata, a difference of over 89 acres. Still, these figures provide an acceptable basis to evaluate the land use changes that have occurred in the District since the adoption of the 2004 Master Plan. This analysis is useful both in determining the degree of effectiveness of the 2004 Master Plan in the course of its implementation, and in identifying matters that require the formulation of new policies to respond to current and anticipated future conditions.

A. NATURAL AREAS

Natural areas constitute approximately 7,800 acres, or 40.2 percent of the District’s land area, an approximate 7.3 percent decrease in area from 2004, largely attributed to the reclassification of properties identified as Recreational Lands in 2004 to other uses, such as the Meadowlands Sports Complex being classified within its own land use category. (See Figure 3.3 “Natural Areas.”) Although it continues to provide recreational functions, the extent of land within the Meadowlands Sports Complex covered by structures and pavement does not qualify the site as a natural area. While the Recreational Lands category currently comprises 190 acres of land in the District, there are approximately 460 acres of parks, detailed in the Recreational Land summary below, which includes portions of properties classified as Wetlands.



Figure 3.3 NATURAL AREAS

2004 ACRES	2004 PERCENT	2018 ACRES	2018 PERCENT	CHANGE (ACRES)	CHANGE (%)
8,409.9	43.2%	7,800.8	40.2%	-609.0	-7.2%

SOURCE: MERI GIS

The predominant land use category in the District is the Wetland category, constituting almost one-third of the District’s land area. Properties classified as Wetlands and Water collectively comprise approximately 7,610 acres, a 0.6 percent decrease from the 2004 calculated total of 7,653.3 acres. This category is not inclusive of all wetlands within the District, as areas of wetlands do exist on properties classified within other uses, particularly within utility rights-of-way (ROWS). The prevalence of these natural areas within the District continues to be the leading influence on the NJSEA’s land use policies. Additional detail regarding wetlands and waterways in the District can be found in [Chapter 5 – Environment](#).

1. WETLANDS AND WATER

Lands classified as Water comprise 1,397.5 acres, or 7.2 percent, of the District's land area. The District's key water attribute is the Hackensack River, which separates the eastern and western portions of the District, and its network of tributaries. The primary function of the Hackensack River and its tributaries is to provide hydrologic support to the adjoining wetland areas and their diverse flora and fauna. The waterways offer opportunities for observation, education, recreational, and scientific activities relative to the Meadowlands environment.

The 2004 Master Plan estimated that 8,400 acres of wetlands remained in the District, even though 5,783.6 acres were actually classified as wetlands in the 2004 existing land use inventory. Wetlands are currently classified on 6,213 acres of the District's land area. Although Figure 3.2 indicates an increase in the area of wetlands in the District since 2004, this gain is offset by the reduction of areas designated within the Water category. The following explains the methodology and circumstances that comprised this updated analysis of natural areas within the District.

- **RECLASSIFICATION:** Many areas designated as Water within the 2004 Existing Land Use Map have been reclassified to the Wetland category, primarily due to the presence of tidally-influenced lands, such as mudflats, within designated tax lots. Exceptions to this classification include areas where there are definitive edges to the shoreline, such as a bulkhead. It should be noted that the land use category of Wetlands in this Master Plan may include properties that are not officially defined as wetlands by State and Federal permitting authorities.
- **TECHNOLOGY:** Advances in technological tools, such as higher-resolution aerial mapping and drone technology, have permitted improved identification of wetland areas within the District since 2004. These advances have allowed for a more refined analysis of land use throughout the District. For example, a single property containing wetlands on a portion of the site, classified in 2004 as a land use category within the Developed Land array, may now hold a split classification between the Wetlands category and another land use category. This dual-classification methodology has resulted in both gains and losses to wetlands categorization on a per-property basis.
- **SITE REMEDIATION:** Some sites consisting of altered lands or brownfield areas that had contained a portion of wetland areas on the property were classified in 2004 as wetlands in their entirety. Since 2004, many of these properties were subject to remediation, which may or may not have required impacts to existing wetlands depending on the location and extent of the remediation. The 2004 Land Use Plan did account for the remediation of several of these wetland properties, as they were not designated as a Preserve in 2004.
- **SITE DEVELOPMENT:** In some cases, portions of sites classified as wetlands contained upland portions that may have undergone site development since 2004. Development in many instances did not result in an actual loss of wetlands, but more accurately, a reduction in the number of acres classified as wetlands in the existing land use inventory between 2004 and the present. It is a formidable challenge to definitively calculate the area of wetlands present within the District due to the changing nature of wetlands, particularly within a tidal environment such as the Hackensack Meadowlands.

In the 2004 Master Plan, a total of 7,653.3 acres of land were classified as either Wetlands or Water in the existing land use analysis, whereas 7,610.7 acres were classified as such in the current land use analysis herein, a difference of 42.6 acres (see Figure 3.2). A total of 7,128.7 acres were classified in the Preserve Planning Area of the 2004 Land Use Plan, with the intention to protect wetlands remaining in the District. The Preserve Planning Area also included some upland areas.

Of the 42.6 acres reduction in Wetland classified, approximately 27.7 acres of reduced Wetland area resulted from development actions on properties located within a Preserve Planning Area in 2004, i.e., properties intended to remain classified as wetlands. The specific properties appear in Figure 3.4 “Development Sites Classified as Wetlands or Water Land Use in 2004.”

Figure 3.4 DEVELOPMENT SITES CLASSIFIED AS WETLANDS OR WATER LAND USE IN 2004

MUNICIPALITY	BLOCK	LOT	ADDRESS	ACRES RECLASSIFIED FROM WETLANDS/ WATER
Carlstadt ¹	84	5	ETHEL BLVD	1.5
Carlstadt ²	131	5.01	725 WASHINGTON AVE	4.8
East Rutherford ³	108.04	4	ROUTE 3 E (SERVICE ROAD)	2.0
East Rutherford ⁴	108.04	5.02	40-80 SCHINDLER CT	4.7
Jersey City ⁵	3101	33	HACKENSACK RIVER, ETC.	1.7
Moonachie ⁶	22	1	140 STATE ST	4.0
North Bergen ⁷	451	20.01, 21, 29.01	2400 PENHORN AVE/ ROUTE 3 E	9.0
TOTAL ACRES				27.7

1. .0192 wetland acres in District disturbed for outfall per USACE permit.
2. USACE Jurisdictional Determination dated July 13, 2009 delineated on-site wetlands. NJMC approval for 20,000 cy of fill for site grading (2010) - no wetlands fill.
3. 0.1 acres wetlands fill per USACE Nationwide Permit #18 (2012).
4. 0.898 acres wetlands fill per USACE permit on 4.25 acre development footprint (38 acres wetland remaining) (2004).
5. 1.7 acres of 17.26-acre lot reclassified from Wetland to Transportation due to NJ Turnpike Interchange 15X construction.
6. Rezoning of site from Environmental Conservation to Light Industrial A, with parallel rezoning of Block 22, Lot 3 (4.8 acres) from Parks and Recreation to Environmental Conservation zone (2010). USACE Jurisdictional Determination dated March 11, 2010 delineated on-site wetlands. NJMC approval for 35,000 cy of fill - no wetlands fill.
7. Rezoning of site from Environmental Conservation to Highway Commercial (2016).

In summary, although properties that were located in the Preserve Planning Area in 2004 are no longer classified as wetland sites within the current land use survey, the actual amount of wetlands fill that occurred for the purposes of site development is minimal in comparison to the total area of reclassified acres, and was generally utilized to fill a portion of a property that contained developable uplands that had been placed in the Wetlands classification in 2004.

More than 3,500 acres of the District’s wetland areas have been restored, mitigated, and/or preserved; however, environmentally-sensitive areas continue to face development pressures, particularly in wetland areas adjacent to uplands. This Master Plan continues the land use planning goals of the 2004 Master Plan to direct development away from “greenfields” and toward suitable upland sites, particularly those characterized as brownfields.

2. RECREATIONAL LAND

Approximately 190 acres of the District are classified as Recreational Land. The largest land area dedicated to recreational features within the District can be found within the Richard W. DeKorte Park, inclusive of the Sawmill Creek Wildlife Management Area in Lyndhurst, including a network of trails and educational facilities. The NJSEA's River Barge Park and Marina in Carlstadt, dedicated in September 2011, provides a relatively new location for public access to the Hackensack River from Bergen County, and features a boat ramp, paddling and rowing launch points, and a 30-slip marina.

While the number of acres classified as recreational land in this Master Plan has decreased in the District since 2004, from 756.6 to 190.1 acres, the number of public parks and recreation areas in the District has increased, including the new Skeetkill Creek Marsh Park in Ridgefield. The significant decrease in the Recreational Land category can be attributed chiefly to the reclassification of approximately 560 acres of the Meadowlands Sports Complex site in East Rutherford to its own existing land use category. In addition, the reclassification of a former golf driving range in Carlstadt and East Rutherford along the Hackensack River waterfront to the Transitional Land category and the relocation of the Lyndhurst Ballfields on Valley Brook Avenue to the Lyndhurst Recreation Center site at Valley Brook and Polito Avenues contributed to reductions in this classification.

A list of public parks in the District appears as Figure 3.5 "Public Parks and Recreation Areas in the Meadowlands District," with their locations shown on [Map 4 – Public Parkland](#).



Figure 3.5 PUBLIC PARKS AND RECREATION AREAS IN THE MEADOWLANDS DISTRICT

MUNICIPAL OWNERSHIP		
MAP ID	LOCATION/NAME	AMENITIES
Little Ferry, Bergen County (2)		
1.	Birch Street Park	Open area
2.	Losen Slote Park	Football, baseball/softball, soccer, hockey
Lyndhurst, Bergen County (1)		
3.	Lyndhurst Recreation Center	Baseball/softball, soccer fields, track, restrooms, indoor recreation
Moonachie, Bergen County (1)		
4.	Concord Street Park	Playground/tot lot, picnic area
Ridgefield, Bergen County (1)		
5.	Meadowlands Field	Baseball/softball field
North Bergen, Hudson County (1)		
6.	North Bergen Municipal Pool	Swim complex
Secaucus, Hudson County (12)		
7.	Buchmuller Park	Little League, baseball/softball fields, basketball, tennis, ice rink, bocce courts, picnic area, handball, shuffle board, ADA compatible rest rooms and playground, kiddie shower
8.	Duck Pond	Picnic area, ADA accessible decks
9.	Eckle Park-9th Street Playground	Pocket park with picnic area, basketball, ADA compatible playground
10.	Farm Road Park	ADA compatible playground, Secaucus Greenway
11.	Ivanoski Park	Picnic area, ADA compatible playground, kiddy shower
12.	Kane Stadium	Baseball, football fields, ADA compatible restrooms, nighttime lighting
13.	Mill Creek Park (Pocket Park)	Buffer
14.	Mill Ridge Field	Baseball/softball fields, nighttime lighting, soccer, chip & putt
15.	Mill Creek Point	Dog park, picnic area, playground, canoe launch
16.	Radio Avenue Park	Walking trails and picnic tables
17.	Secaucus High School Athletic Field	Baseball/softball fields, tennis, basketball, running track, nature trail
18.	Secaucus Recreation Center	Basketball court, indoor track, Olympic-size swimming pool, fitness center
19.	Shetik Field	Soccer, basketball, street hockey
20.	Smit Park	ADA compatible playground, picnic area
21.	Trolley Park (Pocket Park)	Playground, Secaucus Greenway access
COUNTY OWNERSHIP		
MAP ID	LOCATION/NAME	AMENITIES
22.	Hudson County Park at Laurel Hill, Secaucus, Hudson County	Boat ramp, waterfront promenade, walking trails, gazebo, baseball/softball, soccer, cricket field, Snake Hill (a 16-acre rock outcropping)

(Figure continued on next page)

Figure 3.5 cont. PUBLIC PARKS AND RECREATION AREAS IN THE MEADOWLANDS DISTRICT

23.	Mehrhof Pond Wildlife Observation Area, Little Ferry, Bergen County (owned by Bergen County Utilities Authority)	Passive recreation area, benches, bird blind
NJSEA OWNERSHIP		
MAP ID	LOCATION/NAME	AMENITIES
24.	Richard W. DeKorte Park, Lyndhurst, Bergen County	Environmental Center, walking trails, gazebo
25.	Snipes Park, Secaucus, Hudson County	Passive recreation, picnic area, playground
26.	River Barge Park, Carlstadt, Bergen County	Marina, boat ramp, picnic area, fishing
MCT OWNERSHIP		
MAP ID	LOCATION/NAME	AMENITIES
27.	Skeetkill Creek Marsh Park, Ridgefield	Marsh observation area

Note: The list above originally included the 587-acre Richard P. Kane Natural Area as a recreational facility, which is classified in this master plan as a wetland area.

Today, there are approximately 460 acres of publicly-accessible park facilities in the Meadowlands District, including the portion of DeKorte Park in Lyndhurst that is accessible to the public. Although the acreage of parks exceeds the acreage of the Recreational Lands category, Figure 3.6 includes properties that are classified in the Wetland or Public/Quasi Public categories. The Meadowlands District’s municipalities offer additional park and recreation facilities at locations outside the District.

The Hackensack River remains an important asset for educational and recreational purposes. Within the District, the Hackensack River contains a 5-mile river course and a number of shorter “Blue Water” trails for human-powered watercraft. Public boat launches are available at the River Barge Park and Marina in Carlstadt, Hudson County Park at Laurel Hill, and Mill Creek Point in Secaucus (canoe only). Several private boating facilities are located in the District’s portions of Carlstadt, Little Ferry, and Secaucus. These facilities offer a range of amenities, such as boat slips, storage, repair facilities, and public launch areas.

a. **RICHARD W. DEKORTE PARK**

The NJSEA’s administrative offices and education facilities are located within the boundaries of Richard W. DeKorte Park in Lyndhurst. A major stop for migratory birds along the Atlantic Flyway, much of the site was originally an open, tidally-influenced mud flat. Impacted by former landfill operations, the reclamation of the site and its evolution into a park involved habitat restoration and conservation. The park provides 3.5 miles of walking trails, panoramic views, and opportunities to view birds and wildlife. The Meadowlands Environment Center serves as an ecotourism/visitor center, education facility and information resource for ecological and scientific data.



The most recent additions to the DeKorte Park complex are the Center for Environmental and Scientific Education and the William D. McDowell Observatory. The Science Center and Observatory opened in 2008 and provide expanded education and outreach opportunities for the nearly 20,000 residents and students who participate in Meadowlands Environment Center public programming each year. The Observatory's state-of-the-art telescope is

housed under a six-meter retractable dome and features an advanced optical guidance system to cut through light pollution.

The 10,000-square-foot Science Center was the first public building in New Jersey to attain LEED (Leadership in Environmental and Energy Design) Platinum status, the U.S. Green Building Council's highest ranking for achievement of environmental and energy-efficiency standards. The Science Center's green features include rooftop solar panels, ceiling solar tubes, and energy-efficient lighting, heating and cooling systems. Recycled building materials and Forest Stewardship Council-certified wood were used throughout the center's construction.

Individual park elements within Richard W. DeKorte Park include:

- **KINGSLAND OVERLOOK:** Built in 1990, this portion of the park transformed six acres of a Bergen County Utilities Authority (BCUA) sanitary landfill into a series of native plant communities, illustrating the process of natural succession. The landfill closure required the following improvements: a leachate collection system, methane vents, and an impervious synthetic cap partially manufactured from recycled plastic soda bottles.
- **LYNDHURST NATURE RESERVE:** This project involved the reclamation of a 3.5-acre, illegally filled area into wetland and upland habitats, educational facilities, and other site amenities. The project also involved the restoration of a brackish wetland ecosystem and the establishment of an upland northeast woody plant community.
- **MARSH DISCOVERY TRAIL:** A boardwalk trail connects a series of dredge spoil islands within the Kingsland Impoundment. The trail traces the route of Kingsland Creek and provides access to rare wildlife habitats as well as educational and recreational opportunities for bird watchers and nature lovers.
- **TRANSCO TRAIL:** Creation of the dual purpose Transco Trail involved the transformation of a service road for a natural gas pipeline into a self-guided nature trail. The Transco Trail links the various open space components found within Richard W. DeKorte Park. The AMVETS Carillon at the North Arlington end of the trail is a living memorial to our deceased veterans.
- **SAW MILL CREEK TRAIL:** The Saw Mill Creek Trail brings visitors along the vast mudflat of the Saw Mill Creek Wildlife Management Area, providing a unique sense of wide-open space. The base of the Trail was initially built in the 1920's and 1930's as an access road for what are now high tension electric transmission lines. It was reconstructed as a walking trail in 2001.

- **THE COVE (WORLD TRADE CENTER MEMORIAL):** The World Trade Center Memorial is located on the edge of the marsh looking out toward the Lower Manhattan Skyline. It consists of a sinuous freeform wooden deck with two projecting piers, suggesting shadows of the fallen towers. A silhouette of the pre-9/11 skyline, cut from steel, is visible from the deck. NJSEA partnered with Ducks Unlimited to fund the project.
- **JILL ANN ZIEMKIEWICZ MEMORIAL BUTTERFLY GARDEN:** This garden was built to honor the memory of District resident Jill Ann Ziemkiewicz, the youngest member of the flight crew assigned to TWA flight 800, which fell into the ocean off Long Island on July 17, 1996. Jill's Garden was designed as a teaching garden; a living classroom where students can observe butterfly habitat.
- **AMVETS CARILLON:** A 40-foot carillon featuring three bells that toll several times an hour was constructed in 2007 by AMVETS Post 20 in Lyndhurst with assistance from the NJSEA. Benches surround the towers at the site overlooking the open water.

b. MEADOWS PATH

All of the aforementioned trails represent portions of Meadows Path, planned as a 25.5-mile District-wide trail system. When complete, the Meadows Path system will follow the western bank of the Hackensack River from Losen Slote Creek Park in Little Ferry to West Hudson Park in Kearny to connect population centers and provide access to wildlife areas, scenic overlooks, ballfields, bus stops, boating facilities, and restaurants. Completed portions include the following:

- 0.5 miles through Losen Slote Creek Park in Little Ferry;
- 2.25 miles through DeKorte Park in Lyndhurst;
- 1.5 miles along Valley Brook Avenue between DeKorte Park and Meadowlands Corporate Center in Lyndhurst; and
- 1.1 miles along the Saw Mill Creek Trail in Lyndhurst.

c. HACKENSACK RIVERWALK / SECAUCUS GREENWAY

The District's other major trail route is the Hackensack Riverwalk, including the Secaucus Greenway, planned as a 15-mile waterfront greenway through Secaucus, North Bergen, and Jersey City. Upon completion, the Hackensack Riverwalk will allow public access along the eastern bank of the Hackensack River. The portion of the Riverwalk within the Secaucus Greenway will provide a continuous pedestrian trail linking the Secaucus retail, office, commercial, and residential districts, including the Hudson County Park at Laurel Hill, Mill Creek Marsh, and Mill Creek Point Park.

B. DEVELOPED AREAS

Developed areas comprise approximately half of the District's land area, an almost five percent increase from 2004. (See Figure 3.6 "Developed Areas.") The increase in the Developed Areas category can be chiefly attributed to the reclassification of the Meadowlands Sports Complex site from the Recreational Land category. Otherwise, this classification would have remained similar in acreage to the 2004 land area. This indicator does not signify a stagnant development economy in the Meadowlands. Rather, this number is evidence the District's land use objectives, which encourage redevelopment and reuse of available upland and brownfield properties, are being achieved. There are also a large number of transitional properties in the development process, totaling almost 750 acres, which will eventually be classified within the developed land category.



Figure 3.6 DEVELOPED AREAS

2004 ACRES	2004 PERCENT	2018 ACRES	2018 PERCENT	CHANGE (ACRES)	CHANGE (%)
9,271.2	47.6%	9,721.2	50.1%	449.9	4.9%

1. TRANSPORTATION

Transportation-related land uses comprise 20.5 percent of the District’s land area, representing the dominant active land use category within the District. Teterboro Airport is located in the northwestern section of the District, encompassing approximately 827 acres (284 acres of which are classified as natural areas) in the municipalities of Teterboro and Moonachie. Major state and interstate highways traverse the Meadowlands region, including the New Jersey Turnpike (I-95), Route 495, Route 3, Route 17, Route 46, Route 120, Route 280, and Routes 1 & 9. The District also contains nine rail lines serving commuters, long-distance passengers, and freight companies, as well as intermodal rail yards proximate to these lines. A minor 1.1 percent decrease in lands dedicated to transportation use has resulted since 2004, largely due to the identification and reclassification of wetlands within transportation ROWs.

2. INDUSTRIAL

Industrial uses comprise the largest active land use category, covering 3,150 acres, or 16.2 percent, of the District’s land area. The network of major transportation routes through the District, as well as its proximity to New York City, the Port of New York and New Jersey, Newark Liberty International Airport, and various freight rail facilities, establish the District as a mecca for the Industrial sector, particularly for warehouse and distribution facilities. Industrial warehouse and distribution tenants in the Meadowlands submarket have access to over 14 million people within a 25-mile radius, and command among the highest rents in the northern New Jersey industrial market, particularly for Class A industrial space.

These characteristics contributed to a 12.8 percent increase in land area dedicated to industrial uses in the District since 2004, a total increase of approximately 357 acres. As the predominant active land use presence in the District, warehouse and distribution uses comprise the majority of land use applications. The District’s excellent roadway network access and availability of intermodal connections are a key asset and point of attraction. Companies continue to relocate from New York in search of larger and/or more affordable spaces, spaces with higher ceilings, and automation capabilities.

Major warehouse product categories include garment and food distribution, and Bergen Logistics and Goya Foods are prominent warehouse occupants in the District. Light industrial and manufacturing companies are also flourishing in the District, including product manufacturing and food processing facilities. The most notable decline since 2004 has been in the commercial printing industry due to expanded technology that has reduced demand for printed materials.

The strength of the industrial market is being fueled largely by the rapidly changing e-commerce industry and last mile logistics. Last mile logistics refers to the final step of the delivery process from a distribution facility to the end user. Often this step involves small parcel carriers delivering products to consumers. Last mile logistics facilities are popular in urban areas where they are closer to their customer base. Since 2004, FedEx has developed a new 300,000-square-foot distribution center in Jersey City, UPS has occupied a 150,000-square-foot distribution center in Lyndhurst, and Amazon has occupied a 75,000-square-foot facility in Moonachie.

New warehouse space is also proposed to be developed or expanded at various locations throughout the District, including approximately 5 million square feet proposed within the Kingsland and Koppers Coke Peninsula Redevelopment Areas. A number of existing warehouse facilities have optimized their buildings in recent years by raising their ceilings to provide additional storage volume. Additionally, many properties classified in this Master Plan as Transitional Lands are in the process of being redeveloped as industrial uses. Therefore, the share of District land area occupied by industrial uses is anticipated to increase in the coming years.

3. INDUSTRIAL AND COMMERCIAL COMPLEX

Industrial and Commercial Complex uses are present on 163 acres of land in the District, and include both retail outlets and stand-alone retail within mixed use buildings. This category of land use has declined by more than 250 acres, a decrease of more than 60 percent, since the 2004 Master Plan, currently representing a minimal 0.8 percent of land area at scattered locations within the District. This decline is most evidenced by the transformation of the once-thriving retail outlet center in the Town of Secaucus, in the vicinity of American Way and Enterprise Avenue, to a predominantly industrial center with few remaining sites offering accessory retail sales of products stored within the on-site warehouse.

4. COMMERCIAL RETAIL

Retail, restaurants, and similar commercial/service uses have expanded their presence within the District and currently occupy approximately 287 acres within the District, 1.5 percent of the District's total land area. In 2004, retail uses within the District were principally located at the Harmon Meadow complex in Secaucus, which contained multiple retail sites, a movie theater, and fitness center, as well as office space. Since that time, large-scale commercial retail centers have been developed in the District, including Teterboro Landing, anchored by Costco, Wal-Mart and several restaurants, as well as the Wal-Mart Supercenter retail complex in Kearny, contributing to a 24 percent increase in the land area of the District dedicated to retail use. Both the Teterboro and Kearny retail centers were developed on brownfields sites pursuant to NJSEA redevelopment plans.

5. COMMERCIAL OFFICES

Commercial office uses represent a comparatively small component of the District's footprint, occupying 164.2 acres, or 0.8 percent of the District, but they are still an important component of the District's economy. Primary office space in the District can be found in East Rutherford, Secaucus, and Lyndhurst, principally within 2,000 feet of the Route 3 corridor. The land area of office use in the District has decreased by 44.3 acres, or approximately 20 percent since 2004, reflecting the general decline in the stagnant office market.

In many cases, offices have been demolished to respond to market demand in the industrial sector. For example, in Secaucus, the former Panasonic office headquarters was demolished, and a new 300,000-square-foot warehouse occupied by a beer distributor was constructed in its place. An office on Palmer Terrace in Carlstadt was also demolished to accommodate a new 53,000-square-foot warehouse. In Lyndhurst, a 117,000-square-foot vacant office building on Clay Avenue is currently being demolished, and is to be replaced by a 90,000-square-foot warehouse. Despite these losses, some investment in existing office buildings in the District has materialized through the purchase and renovation of office space by new owners, including facilities within Lyndhurst and the Harmon Meadow complex in Secaucus. The largest potential for new office development remains at the Allied site at Secaucus Junction.

6. HOTELS AND MOTELS

The District is home to approximately 4,000 hotel rooms, as detailed in Figure 3.7 "Hotels in the Meadowlands District." Hotel and motel uses constitute 86.9 acres, or 0.4 percent, of the District's land area. Hotels and motels are principally located along Route 3 and within the Harmon Meadow Complex in Secaucus, as well as along the Paterson Plank Road corridor in Carlstadt and East Rutherford. These locations offer convenient access to New York City and the various venues at the Meadowlands Sports Complex, as well as serving numerous area businesses. A number of new hotels have been developed in the District since 2004 in these areas.

Heightened interest in hotel development and redevelopment in the District has been evident in the past few years, presumably in anticipation of the opening of American Dream Meadowlands. Hotel development is planned along the Paterson Plank Road corridor in Carlstadt, with a 149-room Springhill Suites under construction and a 140-room Hilton Garden Inn under review. There has been a continued expansion of hotel development in the Harmon Meadow complex in Secaucus, with the approval of the 175-room Aloft boutique hotel, which is nearing completion, the 154-room Residence Inn by Marriott, which opened in 2015, and a proposed 168-room Hampton Inn. Hotel development is also in the planning stages in Lyndhurst.

Figure 3.7 HOTELS IN THE MEADOWLANDS DISTRICT

MUNICIPALITY	HOTEL NAME	# ROOMS
Carlstadt	Holiday Inn Express	98
Carlstadt	Hampton Inn Hotel	160
Carlstadt	EconoLodge	75
East Rutherford	Fairfield Inn	141
East Rutherford	Residence Inn	133
East Rutherford	Hilton Meadowlands	425
East Rutherford	Extended Stay America	140
Lyndhurst	Courtyard Marriott	219
Lyndhurst	Quality Inn	165
Rutherford	Extended Stay America	127
Rutherford	Renaissance Hotel	167
Secaucus	Candlewood Suites	82
Secaucus	Red Roof Inn	172
Secaucus	Meadowlands Plaza Hotel	176
Secaucus	Rodeway Inn Meadowlands	55
Secaucus	Hilton Garden Hotel	115
Secaucus	Extended Stay America	158
Secaucus	Royal Motel	50
Secaucus	La Quinta Inn and Suites	151
Secaucus	Residence Inn	154
Secaucus	Extended Stay America	132
Secaucus	Holiday Inn Hotel	160
Secaucus	Embassy Suites Hotel	261
Secaucus	Courtyard Marriott Hotel	165
Secaucus	Hyatt Place Hotel	159
Secaucus	Meadowlands River Inn	150
TOTAL		3,990

7. RESIDENTIAL

Residential lands cover approximately 400 acres, or 2.1 percent of the District's land area. The majority of residential uses are centered within established residential neighborhoods in Little Ferry, Moonachie, and Secaucus, which existed prior to the formation of the District.

The growth of residential uses within the District has been one of the dominant land use trends over the last decade, with a total of 3,895 new residential units occupied in the District since 2004. The rise in demand for multi-family mid-rise housing has occurred primarily in locations with access or connections to mass transit, principally geared to New York City commuters. The largest residential development in the District, the Xchange at Secaucus Junction, is located within the Secaucus Transit Village Redevelopment Area and has been developed with 1,584 units. Additional multifamily residences have been constructed along the Route 3 Service Road in East Rutherford (The Monarch), in Lyndhurst (Avalon/Union, Vermella, The Station at

Lyndhurst and The Winston at Lyndhurst), and in Secaucus (Osprey Cove I & II and The Harper at Harmon Meadow).

The ability to accommodate regional growth in housing demand has been assisted by the NJSEA's "Interim Policies Governing Affordable Housing Development in the Meadowlands District," adopted by the New Jersey Sports and Exposition Authority (NJSEA) on July 24, 2008, and last revised on July 27, 2011, which allows the NJSEA to review sites that may be deemed suitable locations to accommodate housing in zones where residential uses are not specifically permitted, in order to expand the supply of affordable housing. Additional detail regarding housing in the District is provided in [Chapter 4 – Housing](#).

8. MEADOWLANDS SPORTS COMPLEX

The Meadowlands Sports Complex site in East Rutherford, which is owned and controlled by the NJSEA, is the largest recreational facility within the District, serving the New York/New Jersey metropolitan region. While this Master Plan is not applicable to the Meadowlands Sports Complex site, pursuant to N.J.S.A. 5:10A-10, the operations on the site do have planning influences on the District, and, therefore, must be evaluated accordingly. The complex includes the following:

- MetLife Stadium, constructed in 2010, is home to two professional National Football League (NFL) football teams, the New York Giants and the New York Jets, and host to several major events including international soccer, entertainment, and other attractions. The Stadium area includes ancillary development and the Giants Training Facility.
- The Meadowlands Racetrack offers both thoroughbred horse and harness racing, along with a state-of-the-art grandstand building constructed in 2013.
- The Izod Center, which closed in 2015, is currently used as a rehearsal venue for performers, and also houses facilities for NJSEA emergency medical services and the NJ State Police.
- American Dream Meadowlands is located within the Meadowlands Sports Complex site. Upon its opening, it will be one of the largest and most unique shopping, entertainment, and tourism centers in the world. The three million-square-foot facility will include a mix of entertainment and retail experiences, including amusement and water parks, shops, a movie theater, and dining.

9. PUBLIC/QUASI-PUBLIC SERVICES

Public/quasi-public services in the District include a diverse variety of facilities, including schools and governmental facilities, and represents 1.7 percent of the District's land area. Governmental uses include two federally-owned bulk mail facilities located in Kearny and Jersey City, a State of New Jersey motor vehicle inspection station in Secaucus, and numerous municipal government facilities.

A number of new public and quasi-public uses have moved into the District since 2004. The Frank J. Gargiulo Campus of the Hudson County Schools of Technology (as known as Hudson County High Tech High School), located in Secaucus, was completed in 2018. The campus achieved LEED Gold Certification for its environmentally sustainable design and was awarded the 2019 US Green Building Council of New Jersey (USGBC-NJ) Leadership in Energy and Environmental Design (LEED) Education Project of the Year. The Town of Secaucus

also expanded the Secaucus Middle/High School facility by more than 90,000 square feet beginning in 2015, and constructed a new 32,000-square-foot recreation center on Koelle Boulevard, which opened in 2009.

10. UTILITIES

Utility uses represent three percent, or approximately 580 acres, of the District’s land area. The Bergen County Utilities Authority (BCUA) sewerage treatment facility in Little Ferry and a natural gas storage facility in Carlstadt owned and operated by Transcontinental Gas & Pipeline Corp. (Transco), a subsidiary of the Williams Companies Inc., are prominent Utility land uses, as is the District’s extensive network of Public Service Enterprise Group’s (PSEG) power generation and transmission facilities. The District’s expanse of wide open spaces is also favored by media and telecommunications industries for placement of radio and cell towers. In many cases, wetlands are present on properties within the Utility classification. Water supply and wastewater treatment are discussed in [Chapter 5 – Environment](#).

Utility companies have recently embarked on several improvements to regional infrastructure to increase capacity and improve resiliency in the event of natural disasters, such as Superstorm Sandy and Hurricane Irene. These improvements include PSEG’s “Energy Strong” initiatives to upgrade substations and switching stations, replace transmission lines and towers, and protect metering stations.

Advances have also been made in the provision of clean, renewable energy sources through the installation of photovoltaic systems by both public entities and private property owners throughout the District. Since the implementation of new green building regulations in 2006, photovoltaic systems generating 42.25 MW of clean energy have been installed in the District as of June 2019.

C. OTHER AREAS

Other areas, consisting of altered, transitional, and vacant lands, comprise 1,874.1 acres, 3.9 percent of the District. (See Figure 3.8 “Other Areas.”)



Figure 3.8 OTHER AREAS

2004 ACRES	2004 PERCENT	2018 ACRES	2018 PERCENT	CHANGE (ACRES)	CHANGE (%)
1,804.4	9.2%	1,874.1	9.7%	69.7	3.9%

1. ALTERED LAND

Altered lands account for 1,067.6 acres of the District's land area and are primarily comprised of solid waste disposal areas. In many cases, altered lands contain the vestiges of the District's historic landfilling operations.

2. TRANSITIONAL LAND

Transitional lands are a fairly large category, representing 3.9 percent of the District's land area, or 748.7 acres that are currently within the development and/or pre-development process. Many of these transitional lands are located within redevelopment areas, including the Koppers Coke Peninsula and Kingsland Redevelopment Areas. The size of this category is indicative of the robust economic health of the District and its appeal as an area for major investment.

3. VACANT LAND

Due to the developed character of the District, there is very little vacant land remaining within its boundaries. Vacant lands represent the smallest category of land uses in the District, comprising only 57.7 acres, or 0.3 percent, of the land area within the District. Vacant lands are predominantly small parcels scattered throughout the District. A reduction of 679 acres of lands formerly categorized as altered or vacant lands has been realized since 2004. This includes lands that have been developed for active land uses, as well as lands that may have been reclassified as transitional lands and wetlands.

III. REDEVELOPMENT

The redevelopment process has proven to be a valuable tool in the implementation of the NJSEA's land use policies for the District, directing development to underutilized brownfield areas and, in the process, remediating contaminated sites and improving the District's built environment. Since 2004, much of the economic growth in the District has been the result of the NJSEA's redevelopment planning efforts.

Amendments to certain existing redevelopment plans are being contemplated to better respond to market conditions with the ultimate goal to enable redevelopment of challenging sites in a manner that can be accommodated without adverse impacts to existing development, neighborhoods, or the environment. In addition, future redevelopment areas are also under consideration in other locations in the District, including the former PSE&G Hudson Generating facility in Jersey City.

In response to the 2004 District Master Plan, the NJSEA codified its redevelopment standards within its District Zoning Regulations. The criteria for establishing areas as in need of redevelopment were based on the criteria of the NJ Local Redevelopment and Housing Law (LRHL). Since that time, the LRHL criteria have been amended, and an evaluation of amendments to the District's redevelopment regulations to promote consistency with State-wide redevelopment policy is warranted. To date, approximately 2,956.8 acres are located within designated redevelopment areas throughout the District, as detailed in Figure 3.9 "Redevelopment Areas in the Hackensack Meadowlands District," also delineated on [Map 6 – Redevelopment Areas](#). A summary of each redevelopment area is provided below Figure 3.9.

Figure 3.9 REDEVELOPMENT AREAS IN THE HACKENSACK MEADOWLANDS DISTRICT

ZONE DESIGNATION	NAME	MUNICIPALITY	SIZE (ACRES)
RA-1	Vincent Place	Teterboro	2.2
RA-2	Paterson Plank Road	Carlstadt, East Rutherford	252.8
RA-3	Highland Cross	Rutherford	28.1
RA-4	Kingsland	Rutherford, Lyndhurst, North Arlington, Kearny	1,362.5
RA-5	Belleville Turnpike	Kearny	77.7
RA-6	Kearny Area	Kearny	444.6
RA-7	Secaucus Transit Village	Secaucus	209.1
RA-8	16th Street	North Bergen	82.6
RA-9	Block 228, Lot 3, Lyndhurst	Lyndhurst	6.0
RA-10	Route 3 East	East Rutherford	44.3
RA-11	Teterboro/Industrial Avenue	Teterboro	63.2
RA-12	Koppers Coke Peninsula	Kearny	367.1
RA-13	Hartz Carpet Center	Secaucus	13.5
RA-14	Schmitt Realty	Secaucus	3.1
RA-15	Hilco	Jersey City	117

RA-1 VINCENT PLACE REDEVELOPMENT AREA - TETERBORO

The Vincent Place Redevelopment Area encompasses 2.2 acres of land within Teterboro, which are located on municipally-owned property. The plan, adopted in 1997, resulted in the construction of 18 dwelling units in two phases, which increased the available housing stock within the Borough. The plan also includes landscaped buffer requirements to minimize conflict with adjacent industrial uses. In addition to medium-density residential, permitted accessory uses include recreational facilities, day care facilities, and maintenance and utility facilities.

RA-2 PATERSON PLANK ROAD REDEVELOPMENT AREA – CARLSTADT & EAST RUTHERFORD



The Paterson Plank Road Redevelopment Area consists of approximately 250 acres along the Paterson Plank Road corridor in Carlstadt and East Rutherford, extending from the NJ Transit Pascack Valley Rail line near Route 17 to the west and Michele Place to the east. The redevelopment area also includes some properties along Washington Avenue in Carlstadt. The plan was originally adopted in 2003, and was amended in 2004 to include the properties along Washington Avenue and Michele Place. The

plan was last amended in 2012 to provide more flexibility in the plan's implementation to support the existing industrial base located in the redevelopment area, and to provide additional development potential to properties along Paterson Plank Road. The redevelopment plan divides the area into three zones: Commercial Gateway Center, Light Industrial Center, and Environmental Preservation Area. The plan is intended to redevelop the Paterson Plank Road corridor with uses complementary to the adjacent Sports Complex site, supportive of the industrial neighborhoods in the vicinity of the Paterson Plank Road corridor, and protective of wetlands within the redevelopment area.

Large-scale redevelopment of the area is challenged by the number and extent of nonconforming properties with diverse ownership. The redevelopment area contains a concentration of sites with known or suspected contamination, including three Superfund sites. The Scientific Chemical Processing Superfund site, now owned by the Borough of Carlstadt, will be the site of a 1.55-MW photovoltaic array. The Universal Oil Products (UOP) site in East Rutherford, including land both within and outside the District boundaries, is in various stages of remediation. A portion of the UOP site beyond the District boundary line in East Rutherford has been redeveloped with big-box and strip-commercial retail. The portion of the UOP site within the District contains the NJ Transit Meadowlands rail spur, which serves the Sports Complex, and wetlands that are currently the subject of remedial investigation and interim remedial measures under the oversight of the USEPA. In addition, the redevelopment area contains two sections, Upper Berry's Creek and Middle Berry's Creek, of the Berry's Creek Study Area (BCSA), which is Operable Unit 2 (OU2) of the Ventron/Velsicol Superfund site located just north of the redevelopment area in Wood-Ridge.

The redevelopment area was the recipient of a 1999 USEPA Brownfields Demonstration Pilot Grant, which resulted in the completion of Preliminary Assessment (PA) reports for a total of 121 acres in the District. In 2005, a USEPA Brownfields Assessment Grant was awarded to conduct environmental assessments of priority sites and to conduct outreach to property owners within the redevelopment area.

Despite these challenges, properties within the redevelopment area have been the subject of increased development interest since the adoption of the redevelopment plan, primarily in the form of new hotel development in anticipation of the opening of American Dream Meadowlands at the Meadowlands Sports Complex site, as well as new warehouse development.

RA-3 HIGHLAND CROSS REDEVELOPMENT AREA – RUTHERFORD

The Highland Cross Redevelopment Area contains approximately 28 acres in the District, with an additional two acres located beyond the District boundary, in the Borough of Rutherford. The redevelopment area is located in the vicinity of Highland Cross and Borough Street to the east of Route 17. The area was a brownfield site that formerly housed the Joint Meeting Sewer Plant. The redevelopment plan for the area was adopted in 1998, and amended in 2001 and 2014.

Zoning approvals for a 216-room hotel and two office buildings totaling approximately 923,000 square feet were issued in 2001 and 2002, respectively. However, due to market conditions, site development did not materialize.

In 2004, a portion of the redevelopment area was redeveloped with a new public works facility for the Borough of Rutherford. The property owner and designated redeveloper of the remaining in-District properties within the redevelopment area, Linque-H.C. Partners, LLC, submitted a petition to the NJSEA in 2017 for a redevelopment plan amendment to redevelop the site with industrial uses. This petition is currently under review by NJSEA staff.

RA-4 KINGSLAND REDEVELOPMENT AREA – RUTHERFORD, LYNDHURST, NORTH ARLINGTON & KEARNY

The Kingsland Redevelopment Area is the largest redevelopment area in the District, and includes approximately 1,363 acres of land in four different municipalities (Lyndhurst, Rutherford, North Arlington, and Kearny). The site is bordered to the north by the NJ Transit Bergen Rail Line, to the south by Belleville Turnpike, to the east by the Saw Mill Creek Wildlife Management Area, and to the west by the NJ Transit Kingsland Rail Line. The purpose of this plan is to facilitate the environmental closure of landfills, as the area is home to eight former landfills.

The Kingsland Redevelopment Plan was last amended in 2011, and supersedes the Meadowlands Golf Course Redevelopment Plan that had been in place on properties within the redevelopment area prior to 2009. The Kingsland Redevelopment Plan intends to create a Sustainable Energy Park on former landfill areas that are not suitable for vertical development, promoting their intended reuse for renewable energy facilities, and also seeks to accommodate mixed-use development, including warehouse and distribution, industrial, and commercial uses, while providing for wetlands preservation. This plan encourages sustainable design and high standards of creative layout, design, and construction in the development and use of the land, as well as the provision of public recreation trails as part of the Meadows Path trail system.

In 2015, a partnership of developers Russo Development and Forsgate Industrial Partners successfully bid to purchase and redevelop a portion of the redevelopment area, and acquired 718 acres of former landfill areas from the NJSEA in June 2019, which includes the Avon, Kingsland, Lyndhurst, Rutherford East, Rutherford West, and Northern Node landfills. The partnership submitted a proposal for the phased development of approximately 3 million square feet of warehouse and distribution facilities in the vicinity of Valley Brook Avenue in Lyndhurst. The redeveloper is responsible for the implementation of final landfill closure measures on their properties. The Avon, Kingsland, and Rutherford East landfills have been formally closed. The Erie and 1-E Landfills continue to be owned by the NJSEA.

RA-5 BELLEVILLE TURNPIKE REDEVELOPMENT AREA – KEARNY

The Belleville Turnpike Redevelopment Area encompasses 78 acres of land situated in the vicinity of Barszcewski Street in the Town of Kearny. The Redevelopment Area is bounded by the 1-E Landfill and Belleville Turnpike to the north, the NJ Transit Boonton Rail Line and Kearny Freshwater Marsh to the south, and a mix of industrial land uses located beyond the inactive Harrison-Kingsland Rail Line along the Meadowlands District boundary to the west.

The Belleville Turnpike Redevelopment Plan, originally adopted in 1996, was revised on September 28, 2011. The plan is designed to accommodate uses that support the efficient movement of products to the market given the redevelopment area's proximity to Port Newark/Elizabeth Marine Terminal. Since the inception of the plan, Barszcewski Street has been reconstructed, and three new warehouse and light industrial buildings totaling approximately 367,000 square feet have been constructed to date, with approximately 70,000 square feet of additional development potential available on a remaining 3.3-acre vacant parcel. The plan accommodates large-sale distribution facilities, as well as a variety of related land uses.

RA-6 KEARNY AREA REDEVELOPMENT AREA – KEARNY

Last amended in 2014, the Kearny Area Redevelopment Area contains approximately 445 acres of land in Kearny in the southwestern corner of the District. The redevelopment area is situated to the south of the inactive Harrison-Kingsland Rail Line and Kearny Freshwater Marsh, to the north of the Port Authority Trans-Hudson (PATH) Rail Line, and to the west of the New Jersey Turnpike Western Spur. In addition, the redevelopment area is bisected by several ROWs, including Interstate 280, Newark-Jersey City Turnpike (Route 508), a Conrail freight line, and PSE&G electric transmission lines. The redevelopment area includes the presence of a USEPA Superfund site (Diamond Head Oil Refinery) and three landfills, including the Keegan Landfill, which is owned and operated by the NJSEA. Natural features, including wetlands and Frank's Creek, are also present within the redevelopment area.

The Kearny Area Redevelopment Plan, originally adopted in 2000 and last revised on June 25, 2014, encourages the development of industrial and commercial ratables, the creation of renewable energy facilities, the environmental closure of former landfills, the promotion of recreational opportunities, and the preservation of wetlands. The plan divides the redevelopment area into six zones to accomplish these objectives: (1) Harrison Avenue Retail Center; (2) Light Industrial Center; (3) Heavy Industrial Center; (4) Keegan Landfill Center, (5) Landfill Reclamation Area, and (6) Environmental Preservation Area.

Since the adoption of the redevelopment plan, the area has been highly successful in accomplishing the plan's redevelopment efforts, particularly within the Harrison Avenue Retail Center, which was redeveloped with a 163,200-square-foot Wal-Mart Super Center, completed in 2007, and an additional 22,000 square feet of retail and restaurant development, including a Wawa convenience store and a Taco Bell.

The plan also enabled the construction of 320,687 square feet of warehouse and distribution facilities off of Bergen Avenue, along with the improvement of Bergen Avenue and its extension between Harrison Avenue and Schuyler Avenue to promote better access to points within and beyond the redevelopment area.

RA-7 SECAUCUS TRANSIT VILLAGE REDEVELOPMENT AREA – SECAUCUS

The Secaucus Transit Village Redevelopment Area encompasses approximately 209 acres in the Town of Secaucus, in the vicinity of the Frank R. Lautenberg Rail Station at Secaucus Junction. The subject redevelopment area is generally bounded by the Hackensack River to the west, Paul Amico Way (formerly New County Road) and the New Jersey Turnpike to the southeast, Jersey City Water Supply line to the north, and the NJ Transit Main Line and light industrial properties along Castle Road and Seaview Avenue to the north. Located to the southwest of the area is the 104-acre Hudson County Park at Laurel Hill and the newly-constructed Frank J. Gargiulo Campus of the Hudson County Schools of Technology (also known as Hudson County High Tech High School). In addition, wetlands exist in the western portion of the redevelopment area adjacent to the Hackensack River.

The Secaucus Transit Village Redevelopment Plan, adopted in 2004 and last revised on July 20, 2017, provides for a mix of uses, including residential, hotel, commercial, and office development, within four zones: (1) Station Square, (2) Transition, (3) Riverfront Landing, and (4) Passive Recreation. The adjacent rail station is the focal point for the area's redevelopment efforts, supporting the concept of

creating a transit village in the subject area. Excellent recreational opportunities also exist, given the redevelopment area's proximity to the Hackensack River and adjacent Hudson County Park at Laurel Hill. Substantial progress has been made toward the redevelopment of the area, including the phased construction of 1,548 dwelling units, including 188 affordable units, at the Xchange at Secaucus residential development within the Riverfront Landing zone. As part of this project, a new portion of the Secaucus Greenway system has been established to provide public access along the Hackensack River within the Riverfront Landing zone of the redevelopment area.

Significant circulation improvements have been made in the area, including the opening of New Jersey Turnpike Interchange 15X in 2005, the extension of Seaview Drive, County Road/Paul Amico Way



(New County Road)/County Avenue improvements and signalization, and the grade separation of vehicular, rail, and pedestrian traffic along Paul Amico Way. Additionally, the plan's environmental preservation goals have been effectuated through the NJSEA's acquisition of the 34.8-acre Hawk Marsh in the Passive Recreation zone.

In addition to build-out of the Riverfront Landing zone, future development in the area is anticipated to occur within the Transition and Station Square

zones, with a main goal to encourage property containing interim commuter surface parking lots to accommodate mixed-use vertical development of transit-oriented uses to realize the plan's goals of creating a true transit village at this location. The Town of Secaucus submitted a petition to the NJSEA in 2018 for a redevelopment plan amendment to include additional residential units within the Riverfront Landing and Transition zones. This petition is currently under review by NJSEA staff.

RA-8 16TH STREET REDEVELOPMENT AREA – NORTH BERGEN

The 16th Street Redevelopment Plan, originally adopted in 1999 and last revised in March 2001, encompasses 82.6 acres of land in the vicinity of 16th Street in North Bergen. The 16th Street Redevelopment Area is bounded by the Northeast Corridor Rail Line to the north and northwest, Secaucus Road to the southwest, and the NYS&W Rail Line to the east. The plan provides for redevelopment of the site for intermodal usage. The NJSEA staff is reviewing a petition for a redevelopment plan amendment submitted by the property owner, National Retail Systems, Inc., to permit an increase in the permitted ratio of trailer parking areas.

RA-9 LYNDHURST BLOCK 228 LOT 3 REDEVELOPMENT AREA – LYNDHURST

The Lyndhurst Block 228 Lot 3 Redevelopment Area totals approximately six acres in area, and is bounded by Wall Street West to the south, east and west, and New Jersey State Route 3 and Route 17 interchange ramps and Service Road to the northwest. The redevelopment area, which is the site of the former DeMassi Cadillac dealership, had sat vacant for more than 20 years before being developed with a 328-unit residential complex, which was completed in April 2008.

RA-10 ROUTE 3 EAST REDEVELOPMENT AREA – EAST RUTHERFORD

The Route 3 East Redevelopment Area is comprised of approximately 44.3 acres along the Route 3 East Service Road in East Rutherford. The redevelopment area is located east of the NJ Transit

Bergen Line Rail Line, west of the New Jersey Turnpike Authority's 16W Interchange, and directly adjacent to the Berry's Creek Canal to the southwest of the area. The only vehicular access to the redevelopment area is via the Route 3 East Service Road along the north side of the redevelopment area boundary.

The goal of the redevelopment plan is to allow development of the upland portion of the redevelopment area with minimal to no impact to the existing wetlands, which constitute the majority of the redevelopment area.

The redevelopment area has been developed with a 316-unit midrise residential development on a 4.25-acre development footprint. The project involved the filling of 0.898 acre of wetland to square off the existing upland development footprint and the preservation of the remaining 38 acres of wetlands on the site.

RA-11 TETERBORO/INDUSTRIAL AVENUE REDEVELOPMENT AREA – TETERBORO

The Teterboro/Industrial Avenue Redevelopment Area is located on the former Honeywell site in the northwesterly corner of the District in Teterboro opposite Teterboro Airport, and totals 63.2 acres in area. The redevelopment area is bound by the NJ Transit Pascack Valley Rail Line to the west, New Jersey State Highway US Route 46 to the north, Industrial Avenue to the east, and Malcolm Avenue to the south. A principal goal of the redevelopment plan is to encourage business opportunity and economic growth.

The redevelopment plan for this area permits a variety of uses such as office, retail, commercial, industrial and passive and active recreation. The redevelopment plan has enabled the transformation of the area from industrial brownfields into a thriving commercial center through the construction of Teterboro Landing, a mixed-use development featuring approximately 378,000 square feet of retail and restaurant development, anchored by Costco and Wal-Mart big box developments. A warehouse building of approximately 150,000 square feet was constructed for Lindenmeyr Munroe, a paper distributor, within the redevelopment area, and additional commuter parking spaces have been provided to promote increased usage of NJ Transit's adjacent Teterboro rail station along the Pascack Valley Line and the NJ Transit bus routes along Route 46.

RA-12 KOPPERS COKE PENINSULA REDEVELOPMENT AREA – KEARNY

The Koppers Coke Peninsula Redevelopment Area is comprised of 74 properties and totals 367.1 acres in area in the Town of Kearny. The area is heavily industrial in character, and generally bounded by the Hackensack River to the north and east, Route 7 (Belleville Turnpike and Newark/Jersey City Turnpike) to the south, and the Kearny Brackish Marsh to the west. The area also includes properties on Cross Pike Drive and Fish House Road.

Numerous properties in the redevelopment area contain evidence of soil, groundwater and/or surface water contamination, with many properties in various stages of remediation. The historic usage of several of these properties contributed to the current environmental contamination present in the area. These brownfield properties include, but are not limited to, the contiguous sites of Koppers Coke, Diamond Shamrock, and Standard Chlorine, a designated USEPA Superfund Site, within Block 287, which together comprise almost two thirds of the redevelopment area.

The Koppers Coke Redevelopment Plan was adopted in February 2013, and permits a variety of land uses, primarily industrial in nature, while also providing opportunities for services to support

planned new industry within the redevelopment area. The NJSEA is currently reviewing a proposal for the development of approximately 2 million square feet of warehouse and distribution facilities within four buildings on 168 acres along the Hackensack River.

RA-13 HARTZ CARPET CENTER REDEVELOPMENT AREA – SECAUCUS

The Hartz Carpet Center Redevelopment Area, totaling approximately 13.5 acres, is located in the Harmon Meadow commercial center and is the former site of two structures that housed carpet wholesale facilities. A portion of Cromakill Creek and associated wetlands are present in the northerly portion of the site within a designated wetland preservation area, which also includes a walking path for passive recreation. The redevelopment plan for the area was adopted in May 2016 to permit multifamily residential use, given the site's location allowing both buffering from, yet proximity to, supportive commercial uses within Harmon Meadow, and access to passive recreation and open space afforded by the marshland. The goals of the Hartz Carpet Center Redevelopment Plan include promoting affordable housing supply and restoring opportunities for passive recreation. The area has been redeveloped with a 469-unit multifamily development, including a 20 percent affordable housing set-aside, by the property owner, Hartz Mountain Industries.



RA-14 SCHMITT REALTY REDEVELOPMENT AREA – SECAUCUS

The Schmitt Realty Redevelopment Area is a 3.1-acre site located along the Hackensack River at the westerly terminus of Paterson Plank Road within the Town of Secaucus. The redevelopment area is the site of a defunct concrete plant located in the midst of an established residential neighborhood.

The redevelopment plan, adopted in 2018, encourages the redevelopment of the site with multifamily housing, which provides for an appropriate infill use consistent with the developed character of the surrounding neighborhood, including other multifamily and townhome developments. The plan also requires the provision of a public waterfront walkway along the Hackensack River as part of the Secaucus Greenway.

The site's redeveloper has submitted an application for the development of 116 total residential units, including 23 affordable units, which is currently under review by the Town of Secaucus pursuant to the District's opt-out provisions.

RA-15 HILCO REDEVELOPMENT AREA – JERSEY CITY

The Hilco Redevelopment Area is a 117-acre site located along the east bank of the Hackensack River, on the west side of Jersey City. The subject property is located north of Duffield and Van Keuren Avenues, west of West Side Avenue and NJ Transit's Main Line, and south of a wetlands area containing Penhorn Creek. The Jersey City Police Pistol Range is located on a northern piece of the

property that is bisected by inactive NJ Transit Boonton Rail Line. The majority of the redevelopment area is occupied by the structures associated with the decommissioned PSEG Hudson Generating Station. Although the plant had been in operation at the site since 1906, as of 2011, only one facility remains in operation at the entire facility, which ran primarily on coal to generate electricity. In 2018, PSEG retired the electrical generating station on the site; however, currently operational PSEG switching stations will remain on Block 3101, Lots 25, 26, 36,37 and Block 7402, Lots 21 and 22. Proposed uses will be forthcoming in a future Redevelopment Plan.

IV. HISTORIC RESOURCES

Historic resources offer a glimpse into the history of the Meadowlands, from their formation over 10,000 years ago as glaciers retreated north at the end of the last Ice Age, through settlement by Native Americans and European settlers, to the Age of Industrialization and modern times.

Various historic surveys completed to date reveal that the Meadowlands District has historic resources dating from the initial human occupation of the region approximately 8,000 years ago. Such surveys include the following:

- Cultural Resource Reconnaissance (1989);
- Stage 1A Archaeological and Historical Sensitivity Evaluation of the Hackensack Meadowlands (1992); and
- Hackensack Meadowlands Archaeological and Historical Sensitivity and Impact Evaluation (1994).



Figure 3.10 HISTORIC RESOURCES IN THE HACKENSACK MEADOWLANDS DISTRICT

MAP #	RESOURCE	LOCATION
1	Outwater Cemetery	West side of Washington Avenue/South of Commerce Road, Carlstadt
2	Former Paterson Plank Road Bridge	East Rutherford
3	Bergen County Rail Line	East Rutherford
4	Canadian Car & Foundry Company	East of Valley Brook and Polito Avenues, Lyndhurst
5	Kingsland Railroad Repair Shops	South of Valley Brook Avenue, East of Orient Way, Lyndhurst
6	(unnamed)	10 Berger Street, Moonachie
7	Phillip Mehrhof House	29 Riverside Avenue (Mehrhof Lane), Little Ferry
8	Ferry Landing & Trading Post	Foot of Riverside Avenue (Mehrhof Lane), Little Ferry
9	Jared De Peyster House	17 Riverside Avenue (Mehrhof Lane), Little Ferry
10	Jared De Peyster Stag House	21 Riverside Avenue (Mehrhof Lane), Little Ferry
11	(unnamed)	37 Riverside Avenue (Mehrhof Lane), Little Ferry
12	(unnamed)	41 Treptow Street, corner of Washington Ave., Little Ferry

(Figure continued on next page)

Figure 3.10 cont HISTORIC RESOURCES IN THE HACKENSACK MEADOWLANDS DISTRICT

MAP #	RESOURCE	LOCATION
13	Roika House	113 Washington Avenue, Little Ferry
14	(unnamed)	141 Washington Avenue, Little Ferry
15	(unnamed)	113 Mehrhof Road, Little Ferry
16	(unnamed)	34 Lafayette Street, Little Ferry
17	(unnamed)	16 Lincoln Street, Little Ferry
18	(unnamed)	26 Lincoln Street, Little Ferry
19	(unnamed)	30 Lincoln Street, Little Ferry
20	(unnamed)	22 Dietrichs Street, Little Ferry
21	Inactive Railroad Track Bridge	NJ Transit Harrison Branch over NJ7, Kearny
22	Bridge for East Bound NJ 3	NJ 3 East Bound over Hackensack/Grace Street, Secaucus
23	Clay Pits of Brick Making Industry	Little Ferry
24	Airport Tower & Hanger, 1945 (now Aviation Hall of Fame & Museum)	Teterboro Airport near Industrial Avenue, Teterboro
25	Atlantic Aircraft Factory, 1930's	Teterboro Airport near Industrial Avenue, Teterboro
26	Bendix Factory Complex	US Route 46 and Industrial Avenue, Teterboro
27	(unnamed)	North Arlington
28	Viaduct, 6-lane divided highway	NJ Route 3 over Berry's Creek, East Rutherford
29	2-lane collector road and sidewalks	Ridgefield
30	Public Service Gas and Electric Company	57-31 Charlotte Avenue, Jersey City
31	(unnamed)	472-518 St. Pauls Avenue, Jersey City
32	Jacob Stouff Property	32 Lewis Avenue, Jersey City
33	Peoples Gas and Light Company	444-500 St. Pauls Avenue, Jersey City
34	Public Service Energy and Gas Corp.	460-468 St. Pauls Avenue, Jersey City
35	(unnamed)	472-518 St. Pauls Avenue, Jersey City
36	(193) Kingsland Tunnel	Newark Avenue and Orient Way, Lyndhurst
37	Covert/Larch Historic District	Jersey City
38	Portal Bridge, Pennsylvania, New Jersey and New York Railroad Co.	Northeast Corridor Rail Line across Hackensack River, Kearny
39	Erie Marion Main Line Historic District	Jersey City
40	West End Interlocking Tower	Jersey City
41	Portal Tower	Secaucus
42	HX Drawbridge Bergen County Line	East Rutherford/Secaucus
43	Secaucus Potter's Field	15X Interchange, New Jersey Turnpike, Secaucus
44	Snake Hill	Secaucus
45	Pulaski Skyway	Jersey City and Kearny
46	U.S. Routes 1 & 9	Jersey City and Kearny
47	Lower Hack Draw Bridge	NJ Transit Morristown Line, Milepost 2.52 through 2.64, Jersey City
48	Old Main Line of the Delaware, Lackawanna & Western Rail Road Historic District	Jersey City and Kearny

(Figure continued on next page)

Figure 3.10 cont HISTORIC RESOURCES IN THE HACKENSACK MEADOWLANDS DISTRICT

49	Wittpenn Bridge	Belleville Turnpike/NJ Route 7 over Hackensack River, Jersey City and Kearny
50	Hudson Tower	Kearny
51	(unnamed)	Kearny
52	Pennsylvania Railroad New York to Philadelphia Historic District	Kearny and Secaucus
53	Hudson & Manhattan Railroad	Kearny
54	WMCA 570 Radio Station Relay/ Transmitter Building	Belleville Turnpike at New Jersey Turnpike, Kearny
55	Substation 4 (Amtrak Substation 41)	Northeast Corridor at New Jersey Turnpike, Kearny
56	Jersey City Waterworks Pipeline	Jersey City, Lyndhurst, North Arlington, Secaucus

SOURCE: MERI GIS/NJ HISTORIC PRESERVATION OFFICE (2019)

The NJ State Office of Historic Preservation assists in identifying and preserving the State’s historic and archaeological resources, including a number of District resources. Figure 3.10 “Historic Resources in the Hackensack Meadowlands District” provides an inventory of historically-significant resources in the Meadowlands District, whose locations also appear on [Map 5 – Historic Resources](#) in the appendices of this document.

V. BUILD-OUT

The 2004 Master Plan estimated the amount of new development potential that would occur within a 25-year time period. Figure 3.11 “Development Completed Compared to 2004 Master Plan Estimate” compares this estimate to the amount of development actually completed by December 2018, which is just past the halfway mark for the full build-out period. The build-out analysis takes into account only new buildings and building footprint expansions that have received occupancy certification between January 2004 and December 2018. No building renovations, mezzanine additions, or other building improvements have been included in this analysis.

Figure 3.11 DEVELOPMENT COMPLETED COMPARED TO 2004 MASTER PLAN ESTIMATE

DEVELOPMENT TYPE	2004 MASTER PLAN ESTIMATE (2029 BUILD-OUT)	COMPLETED THROUGH DECEMBER 2018
Residential	3,741 units	3,895 units
Commercial	4,493,326 sq. ft.	1,172,274 sq. ft.
Office	7,439,369 sq. ft.	165,550 sq. ft.
Industrial/Warehouse	12,106,359 sq. ft.	4,737,105 sq. ft.
Hotel	1,750 rooms	436 rooms

NOTE: EXCLUDES AMERICAN DREAM DEVELOPMENT AT NJSEA-OWNED PROPERTY IN EAST RUTHERFORD

An additional 400,000 square feet of industrial space, 58,000 square feet of commercial use, and 355 hotel rooms are approved and/or under construction but have not received occupancy certification as of January 2019.

The majority of unrealized development that was projected in the 2004 Master Plan to be built by

2029, was anticipated to be constructed at Allied Junction in Secaucus and within the following three redevelopment areas: Highland Cross, Kingsland, and Paterson Plank Road. The current status of development plans for these locations is as follows:

- Specially Planned Area approvals were granted for over 4.6 million square feet of mixed use development at Allied Junction in 1992. No definitive development plans are forthcoming, and the approvals issued pursuant to the SPA process remain valid. However, any change to the approved SPA plans will require a new zoning review pursuant the NJSEA's Transportation Center zone requirements within the District Zoning Regulations, at N.J.A.C. 19:4-5.117 through 5.122.
- The redevelopers of the Highland Cross Redevelopment Area are evaluating various development scenarios for the property. The prior approval for an office and hotel at the site has lapsed. Redevelopment of this property is subject to access and traffic constraints, which will impact future development plans at the site.
- The rights to acquire and redevelop a portion of the 1,362-acre Kingsland Redevelopment Area have been awarded by the NJSEA through a competitive bid process to a partnership of Russo Development and Forsgate Industrial Partners, which plans to develop approximately 3 million square feet of new warehouse development on former landfill property.
- The Paterson Plank Road Redevelopment Area has been the subject of increased development interest as American Dream Meadowlands nears opening, and as the Meadowlands Sports Complex continues to draw world-class sporting and entertainment events to the area. This development interest has primarily materialized in the hotel sector, with 462 new rooms constructed or planned to be constructed along the Paterson Plank Road corridor since 2004. Approximately 252,000 square feet of new warehouse and light industrial facilities have received zoning approval within the redevelopment area between February 2018 and May 2019.

The NJSEA is also currently reviewing multiple applications for new development in the District that are not accounted for in the build-out analysis above, which evaluates only projects that have received occupancy certification since 2004. The largest of these applications under review include proposals for approximately 3 million square feet of industrial development within the Kingsland Redevelopment Area, discussed above, and 2 million square feet of new industrial development within the Koppers Coke Peninsula Redevelopment Area.



HOUSING

4

4. HOUSING

Housing constitutes only 2.1 percent of land area within the Hackensack Meadowlands District (District). This very small percentage can be attributed to the perception of the Meadowlands as a wasteland that was suitable primarily for uses such as industry and solid waste dumps that people did not want located near established neighborhoods. Although new housing was a significant component of the District's original 1970 Comprehensive Land Use Plan, that housing was intended for wetland areas that are no longer deemed suitable for development. Still, since the adoption of the 2004 NJMC Master Plan, the District has witnessed a significant expansion in housing development in upland areas of the District. This chapter explores the general characteristics of households and housing within the District's municipalities, the challenges associated with housing development within the District, and the resources available to further the creation of housing with an affordable component.

The NJSEA contracted with 4ward Planning, Inc. to provide demographic and housing data where noted herein. Where data specific to the portion of a municipality within the District is not available, it is presented at the overall municipal, county, or regional level. Detailed population characteristics are provided in [Chapter 2 – Population and Economy](#). In some cases, five-year projections are provided to anticipate future trends. Data projections utilize a five-year window, as data beyond this time period are not reliable and, therefore, are not utilized by the NJSEA in this evaluation. The data is also heavily influenced by the characteristics of Jersey City, where the vast majority of its comparatively larger population and associated housing is located outside of the District.

I. HOUSEHOLD PROFILES



As of 2018, there are approximately 496,790 residents in the District's 14 municipalities, with 80 percent (395,990) of this population residing in the four municipalities located within Hudson County and 20 percent (100,790) residing in the ten municipalities located within Bergen County. The actual in-District population is much less due to the relatively small amount of land area occupied by residential uses within the District boundaries.

Pursuant to Figure 4.1 "Number of Household in District Municipalities," as of 2018, the District's municipalities contain approximately 192,380 households, with 80 percent of these households located in the District's four Hudson County municipalities. From 2010 to 2018, the District's municipalities added approximately 15,930 households, a slight increase. Over the next five years, household growth in the District's constituent municipalities is projected to continue to increase at a similar rate, with an increase of 10,370 households expected by 2023.

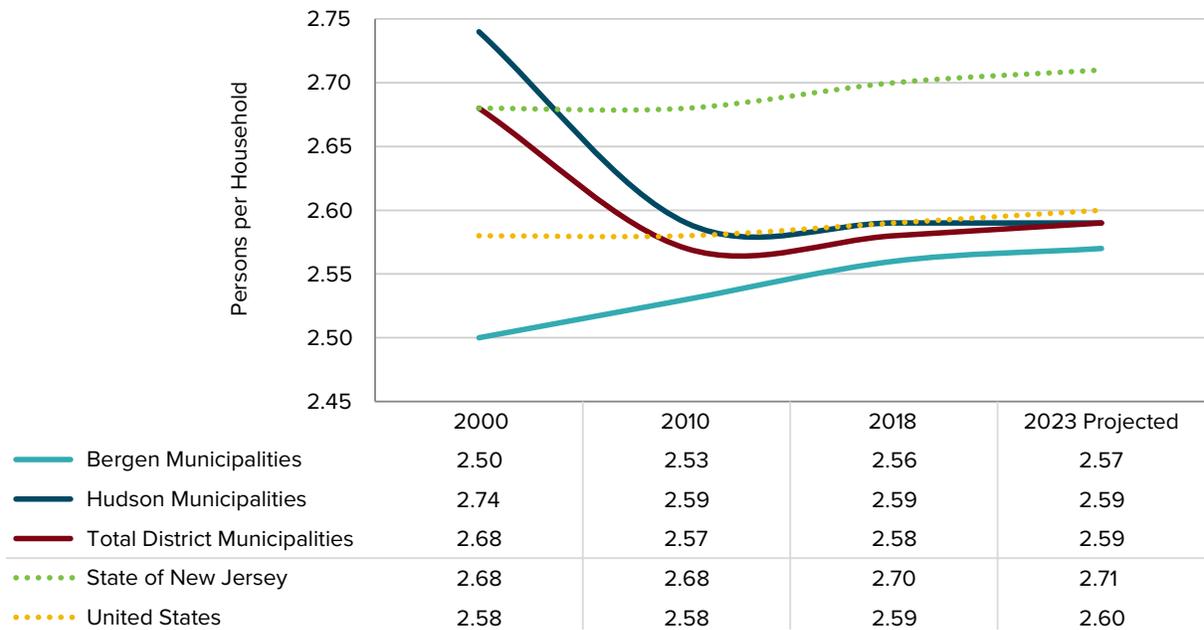
Figure 4.1 NUMBER OF HOUSEHOLDS IN DISTRICT MUNICIPALITIES

	2000	2010	2018	2023 (PROJECTED)
Bergen Municipalities	37,602	37,770	39,340	40,307
Hudson Municipalities	129,621	138,680	153,041	162,994
Total District Municipalities	167,223	176,450	192,381	203,301

SOURCE: 4WARD PLANNING, INC./ESRI

As depicted in Figure 4.2 “Average Household Size in District Municipalities,” the District’s municipalities have an average household size of 2.58 persons, a number lower than the State average of 2.70, but comparable to the nation’s average size of 2.59. Average household size in the District’s municipalities in Bergen County experienced an increase since 2000, while in-District municipalities in Hudson County experienced a decrease in average household size. Household configurations are affected by overall population trends, as more fully explained in [Chapter 2 – Population and Economy](#), and changes in household size could potentially be attributed to a variety of factors including reduced birth rates, divorce, and an aging population. Average household size is expected to remain relatively stable within the District through 2023.

Figure 4.2 AVERAGE HOUSEHOLD SIZE IN DISTRICT MUNICIPALITIES



SOURCE: 4WARD PLANNING, INC./ESRI

Approximately two-thirds of households in District municipalities are comprised of family households, which consist of two or more persons who are related either by birth, marriage, or some other legal construct, such as adoption (see Figure 4.3 “Households by Family Type”). As of 2016, 65 percent of households in the District’s 14 municipalities are identified as family households, slightly less than the 69 percent statewide.

Figure 4.3 HOUSEHOLDS BY FAMILY TYPE

	2016			
	DISTRICT MUNIS	BERGEN MUNIS	HUDSON MUNIS	NEW JERSEY
TOTAL HOUSEHOLDS *	169,088	37,566	141,778	3,195,014
Percent of total households:				
FAMILY HOUSEHOLDS	65.2%	69.2%	64.1%	69.3%
Married couple family	42.8%	52.1%	40.8%	51.0%
Female householder, no husband present	16.4%	11.6%	17.3%	13.4%
With own children under 18 years	33.0%	30.6%	33.4%	33.5%
NONFAMILY HOUSEHOLDS	34.8%	30.8%	35.9%	30.7%
Householder living alone	27.0%	25.5%	27.3%	25.7%
Householder living alone age 65 years and over	7.8%	9.0%	7.6%	10.8%

*Table does not include all sub-categories of Family Households and Nonfamily Households.

SOURCE: 4WARD PLANNING, INC. (US CENSUS BUREAU / AMERICAN COMMUNITY SURVEY)

II. HOUSING STOCK CHARACTERISTICS

Pursuant to Figure 4.4 “Housing Units in District Municipalities,” as of 2018, there are 212,576 housing units within the District’s constituent municipalities. The largest percentage increases in housing between 2000 and 2018 have occurred in Teterboro, which witnessed a more than 230 percent increase in the number of housing units, and Secaucus and Jersey City, each of which experienced over a 30 percent increase.

In terms of total unit increases, Hudson County constituent municipalities generally received the largest total number of units. Within Bergen County constituent municipalities, Lyndhurst and East Rutherford experienced the largest total amount of growth. Moonachie was the only municipality to experience a decrease in total units, which is likely attributed to the effects of Superstorm Sandy.

Figure 4.4 HOUSING UNITS IN DISTRICT MUNICIPALITIES

MUNICIPALITY	2000	2010	2018	CHANGE 2000-2018	% CHANGE 2000-2018	2023 (PROJECTED)
Carlstadt	2,473	2,495	2,549	76	3.1%	2,572
East Rutherford	3,771	4,018	4,414	643	17.1%	4,605
Little Ferry	4,449	4,439	4,533	84	1.9%	4,612
Lyndhurst	8,103	8,787	9,356	1,253	15.5%	9,654
Moonachie	1,074	1,053	1,056	-18	-1.7%	1,060
North Arlington	6,529	6,573	6,678	149	2.3%	6,749
Ridgefield	4,120	4,145	4,431	311	7.5%	4,582
Rutherford	7,214	7,278	7,522	308	4.3%	7,671
South Hackensack	830	879	920	90	10.8%	947
Teterboro	8	27	27	19	237.5%	27
Bergen Municipalities	38,571	39,694	41,486	2,915	7.6%	42,479
Jersey City	93,648	108,720	123,318	29,670	31.7%	132,159
Kearny	13,872	14,180	14,691	819	5.9%	15,247
North Bergen	22,009	23,912	24,651	2,642	12.0%	25,278
Secaucus	6,385	6,846	8,430	2,045	32.0%	9,019
Hudson Municipalities	135,914	153,658	171,090	35,176	25.9%	181,703
TOTAL DISTRICT MUNICIPALITIES	174,485	193,352	212,576	38,091	21.8%	224,182

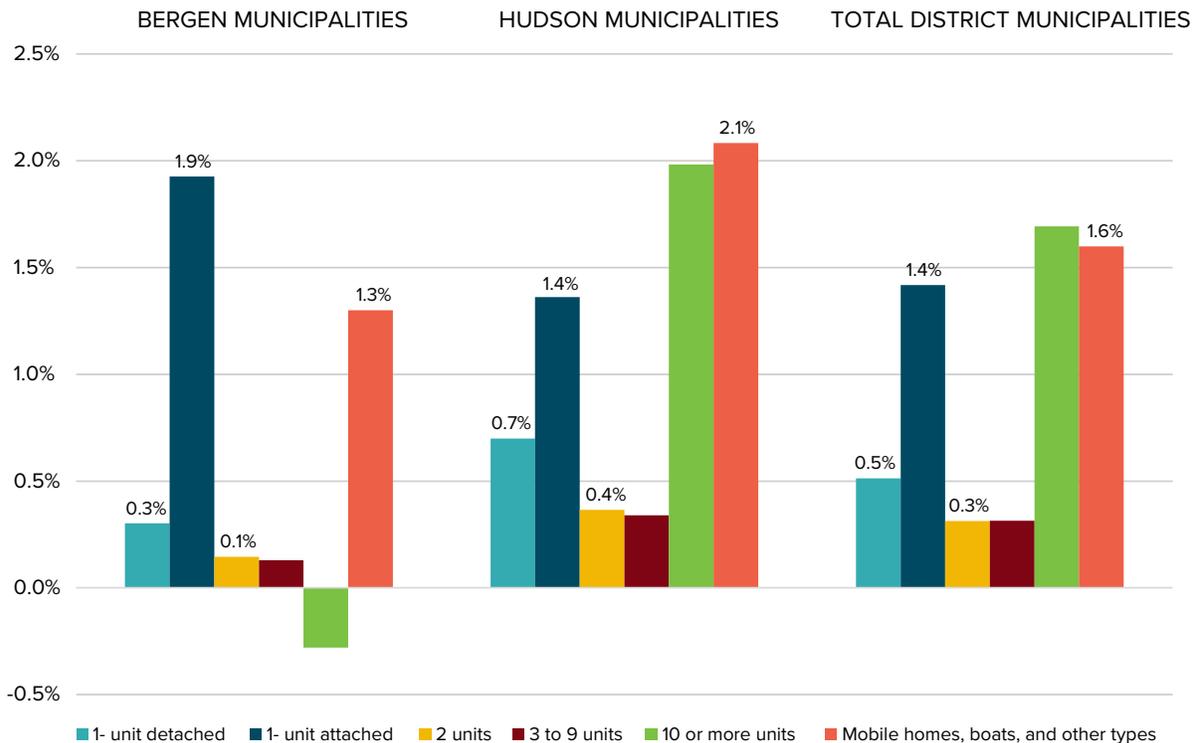
SOURCE: 4WARD PLANNING, INC. / NEW JERSEY DATA BOOK (2000) / ESRI

The number of housing units by type was also evaluated as part of this analysis in Figure 4.5 “Change in Housing Units, by Type (2000-2016),” with current data available through 2016 (which may vary from data in Figure 4.4, current through 2018). Between 2000 and 2016, the number of housing units within the District municipalities increased by 21,735 units (0.89 percent per year). As of 2016, there were approximately 196,180 housing units within the District municipalities, with single-family detached dwellings composing the largest share of housing within in-District Bergen County municipalities (41 percent) and duplexes composing the largest share of housing within in-District Hudson County municipalities (25 percent). Despite relatively flat housing growth, over the same period in-District Bergen County municipalities experienced relatively modest growth in single-family attached units (1.9 percent per year) and mobile homes, boats, and other unit types (1.3 percent per year). However, within the District, new housing development has been primarily in the form of multifamily mid-rise rental units of 10 or more units.

Figure 4.5 CHANGE IN HOUSING UNITS, BY TYPE (2000-2016)

UNIT TYPE	2000			2016		
	BERGEN CO. MUNICIPALITIES	HUDSON CO. MUNICIPALITIES	TOTAL DISTRICT MUNICIPALITIES	BERGEN CO. MUNICIPALITIES	HUDSON CO. MUNICIPALITIES	TOTAL DISTRICT MUNICIPALITIES
1-unit, detached	15,513	17,545	33,058	16,262	19,510	35,772
1-unit, attached	983	8,928	9,911	1,286	10,874	12,160
2 units	11,261	36,442	47,703	11,523	38,570	50,093
3 or 4 units	3,345	19,476	22,821	3,318	20,295	23,613
5 to 9 units	1,228	13,570	14,798	1,350	14,547	15,897
10 to 19 units	2,437	10,037	12,474	1,980	10,447	12,427
20 or more units	3,380	29,612	32,992	3,577	41,778	45,355
Mobile home	413	199	612	495	289	784
Boat, RV, van, etc.	10	62	72	16	59	75
TOTAL UNITS	38,570	135,871	174,441	39,807	156,369	196,176

PERCENT CHANGE:

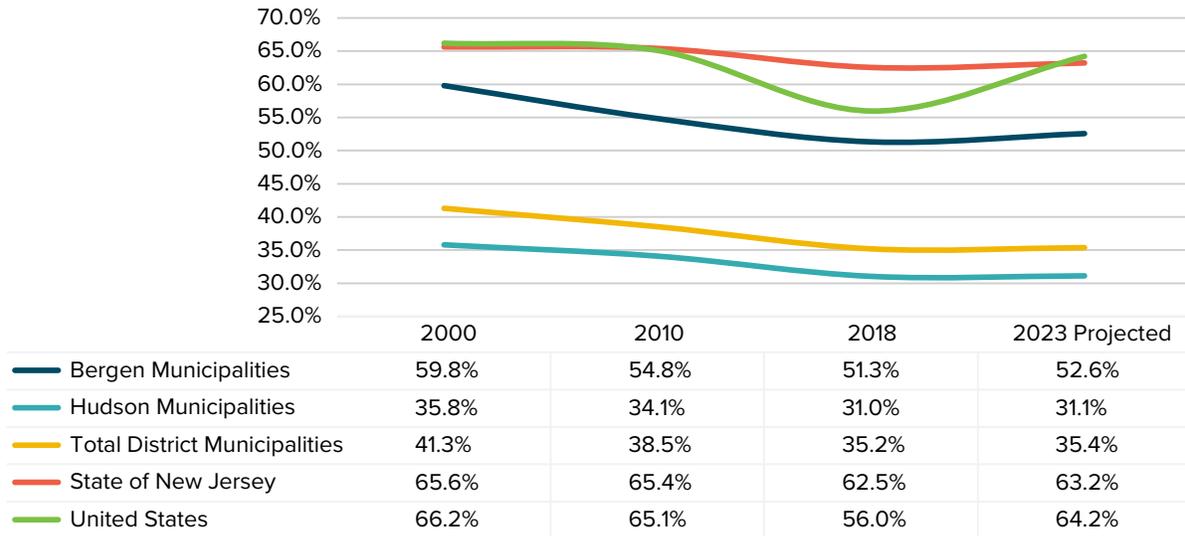


SOURCE: 4WARD PLANNING, INC./US CENSUS (2000) AND AMERICAN COMMUNITY SURVEY (2012-2016)

On average, the percent of housing units that are owner-occupied within the District municipalities (35.2 percent) is much lower than the State (62.5 percent) and the nation (56 percent) in 2018. The share of owner-occupied housing has been decreasing within the District, State, and country; however, homeownership rates are projected to remain relatively stable over the next five years as seen in Figure 4.6 “Homeownership Rates.”

Figure 4.6

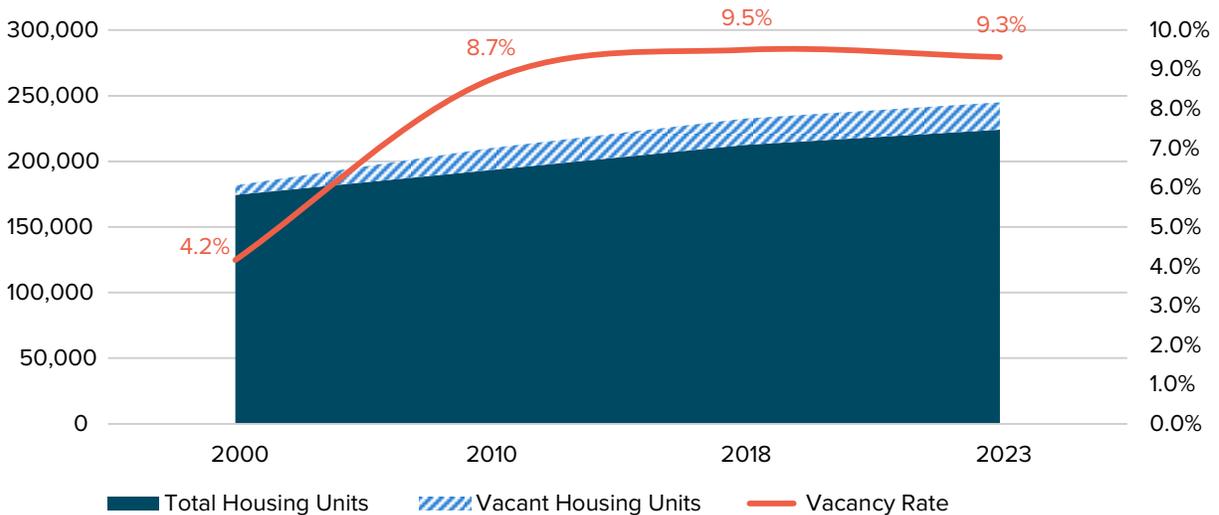
**HOMEOWNERSHIP RATES
(HOUSING TENURE: OWNER- VS. RENTER-OCCUPIED UNITS)**



SOURCE: 4WARD PLANNING, INC./US CENSUS/ESRI (2010-2023)

Figure 4.7

HOUSING VACANCY RATES IN DISTRICT MUNICIPALITIES



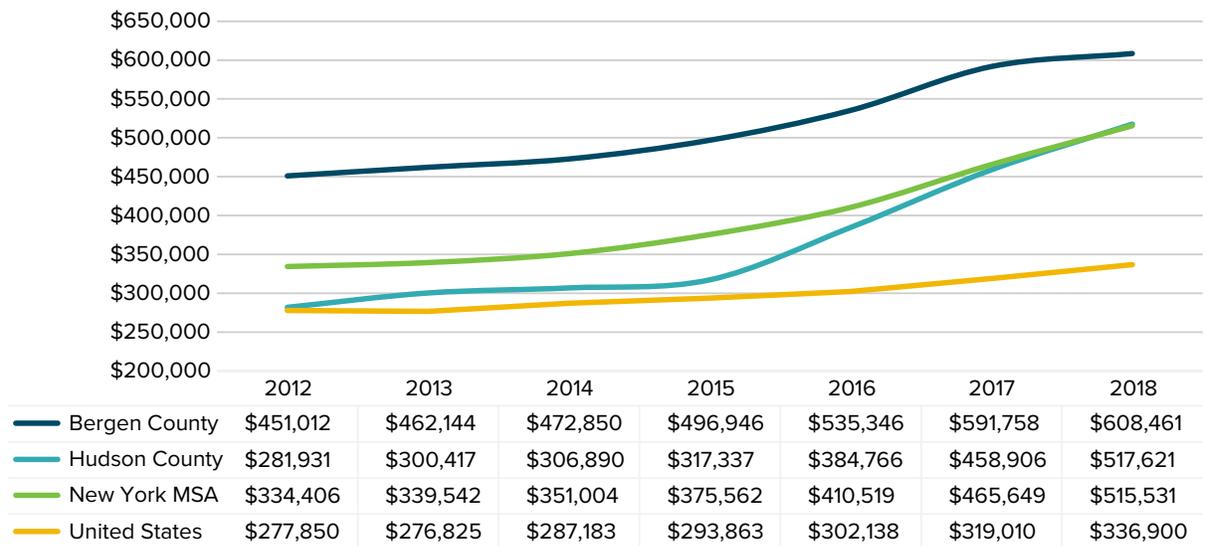
SOURCE: 4WARD PLANNING, INC. / NEW JERSEY DATA BOOK (2000) / ESRI

Housing vacancy rates within District municipalities are provided in Figure 4.7 “Housing Vacancy Rates in District Municipalities.” Approximately 9.5 percent (20,200 units) of units within District municipalities are vacant, with 89 percent of the vacant units located within Hudson County municipalities. Since 2000, vacancy rates in the District’s Bergen County municipalities (ranging from 2.5 percent in 2000 to 5.2 percent in 2018) have been consistently lower than those within Hudson County municipalities (ranging from 4.6 percent in 2000 to 10.5 percent in 2018). While overall vacancy rates within the District’s municipalities have increased between 2010 and 2018 (from 8.7 to 9.5 percent), vacancy rates within the District’s municipalities are projected to decline slightly over the next five years (to 9.3 percent by 2023). This information appears somewhat high in relation to in-District housing occupancy as it relates to

mid-rise rental apartments in the District, which underscores the need for specific Meadowlands housing data to accurately assess the state of Meadowlands housing and population.

Home prices have also decreased steadily, as depicted in Figure 4.8 “Median Sale List Prices for All Homes.” According to the National Association of Realtors, the sale list price refers to the values of houses being put up for sale and does not reflect housing value trends for the entirety of the housing stock in any given geography. The average median list price of homes for sale located in the District’s municipalities differs significantly between Bergen County (\$608,461) and Hudson County (\$517,621), as well as from the New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area (New York MSA) (\$515,531). Between 2012 and 2018 the average median sale list price for homes increased by 13.9 percent per year in Hudson County, 5.8 percent per year in Bergen County, and 9 percent per year in the New York MSA.

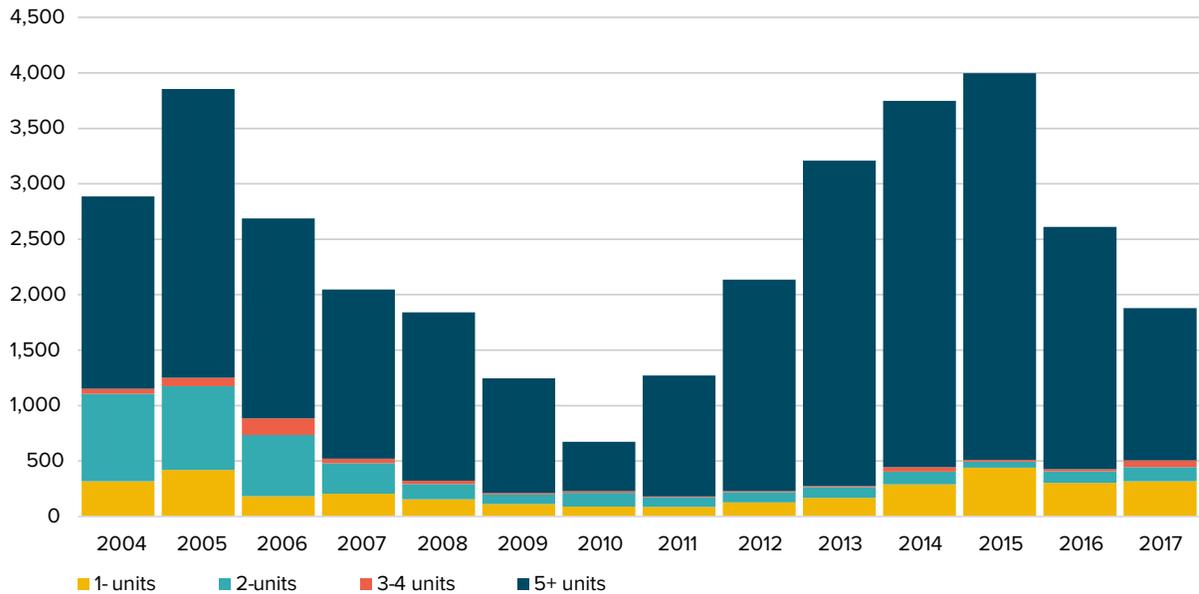
Figure 4.8 MEDIAN SALE LIST PRICES FOR ALL HOMES



SOURCE: 4WARD PLANNING, INC. / NATIONAL ASSOCIATION OF REALTORS

Following the burst of the U.S. housing bubble and the onset of the Great Recession (December 2007 to June 2009), the District municipalities experienced a decline in residential building permits issued after 2005, with a recovery beginning in 2011. As depicted in Figure 4.9 “Residential Building Permits Authorized in District Municipalities,” the number of residential building permits issued in 2015 peaked at nearly 4,000 permits issued, which surpassed the 2005 pre-housing-bubble level. However, this peak was followed by a decline in residential permit activity in 2016 and 2017. In 2017, a total of 1,878 residential permits were issued in the District’s municipalities, with 85 percent located in Jersey City. Almost three-quarters of those permits issued were for units located within buildings of five or more units.

Figure 4.9 RESIDENTIAL BUILDING PERMITS AUTHORIZED IN DISTRICT MUNICIPALITIES



SOURCE: 4WARD PLANNING, INC. / US CENSUS BUREAU

III. HOUSING AFFORDABILITY

Affordability is typically measured for prospective homeowners through the ratio of housing value to income, where a ratio at or below three-to-one is considered affordable. Pursuant to Figure 4.10 “Housing Affordability Profile,” statewide median housing value, when compared to the median household income, exhibits a ratio of 4.3, which is well above an ideal affordability threshold. Both Bergen and Hudson counties have even higher median housing value to median household income ratios; Bergen County has a ratio of 5.0 and Hudson County has a ratio of 5.6. The data provide solid evidence that housing valued at the median level is not affordable to the median-income household in these geographies. Between 2000 and 2016, the ratio of median household value to median annual income increased by one percentage point in Bergen County, and 1.4 percentage points in Hudson County, indicative of an increasingly unaffordable housing market.

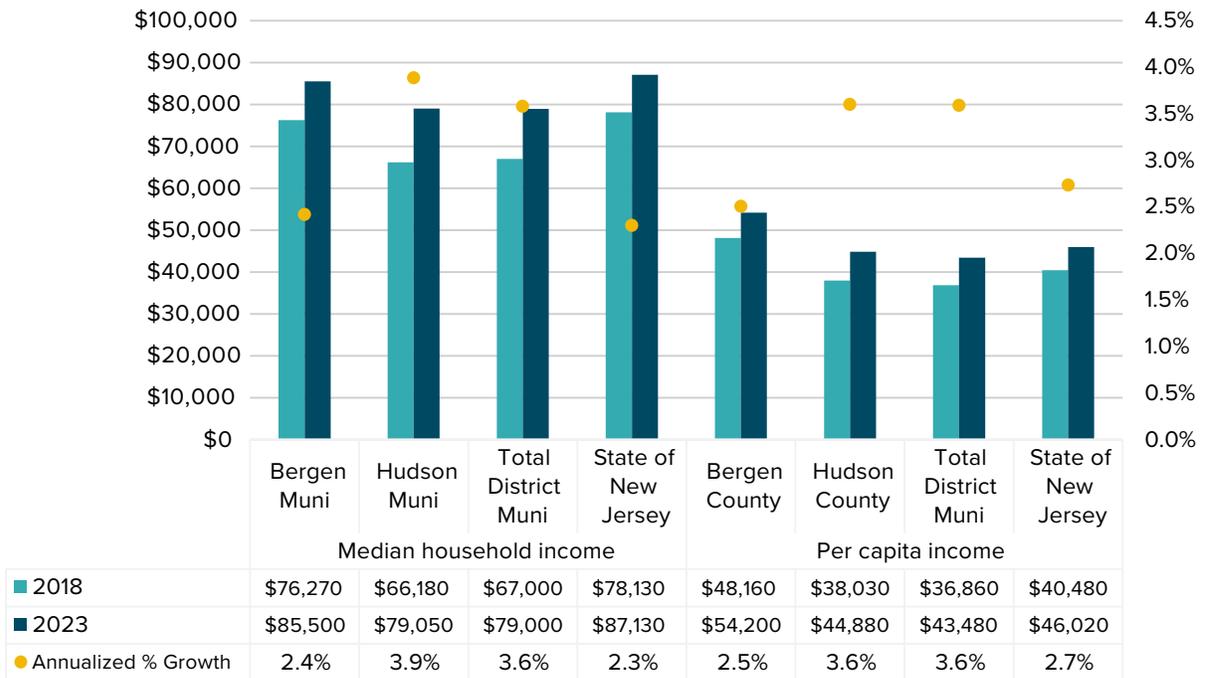
Figure 4.10 HOUSING AFFORDABILITY PROFILE

	2000			2016			CHANGE 2000-2016		
	BERGEN COUNTY	HUDSON COUNTY	STATE OF NEW JERSEY	BERGEN COUNTY	HUDSON COUNTY	STATE OF NEW JERSEY	BERGEN COUNTY	HUDSON COUNTY	STATE OF NEW JERSEY
ALL HOUSEHOLDS									
Median household income	\$61,925	\$37,189	\$54,226	\$88,487	\$60,894	\$73,702	\$26,562	\$23,705	\$19,476
Monthly median household income	\$5,160	\$3,099	\$4,519	\$7,374	\$5,075	\$6,142	\$2,214	\$1,976	\$1,623
OWNER AFFORDABILITY									
Median housing costs for owners with a mortgage	\$1,911	\$1,549	\$1,559	\$2,926	\$2,661	\$2,374	\$1,015	\$1,112	\$815
% median housing costs to median income for owners with mortgage	37.0%	50.0%	34.5%	39.7%	52.4%	38.7%	2.7%	2.4%	4.2%
% owners with mortgage having monthly housing costs at 30% or more of income	35.3%	46.2%	30.8%	42.0%	46.8%	39.8%	6.7%	0.6%	9.0%
% owners without mortgage having monthly housing costs at 30% or more of income	23.0%	31.5%	20.8%	30.6%	32.9%	26.9%	7.6%	1.4%	6.1%
Median housing value	\$245,538	\$154,460	\$171,988	\$443,400	\$341,300	\$316,400	\$197,862	\$186,840	\$144,412
Ratio median housing value to median annual income	4.0	4.2	3.2	5.0	5.6	4.3	1.0	1.4	1.1
RENTER AFFORDABILITY									
Median rent	\$869	\$737	\$763	\$1,380	\$1,247	\$1,213	\$511	\$510	\$450
% households with gross rent > 30% of income	37.8%	41.7%	39.5%	50.1%	47.9%	53.2%	12.3%	6.2%	13.7%

SOURCE: 4WARD PLANNING, INC./US CENSUS (2000) AND AMERICAN COMMUNITY SURVEY (2016)

By the same token, as of 2018 both median household and per capita incomes in the District municipalities (\$67,000 and \$36,860, respectively) were lower than those within the State (\$78,130 and \$40,480, respectively). The municipalities located within Bergen County reported a median household income of \$76,270 compared to those in Hudson County, which reported a median income of \$66,180. From 2018 through 2023, median household and per capita income growth in the District municipalities (both metrics increasing by 3.6 percent per year) are expected to increase at a flat rate, faster than the same metrics within the State (2.3 and 2.7 percent, respectively). Near-term median household income growth in the District municipalities is expected to be particularly strong among the four municipalities located within Hudson County (growing by 3.9 percent per year). (See Figure 4.11 “Median Household Income.”)

Figure 4.11 MEDIAN HOUSEHOLD AND PER CAPITA INCOME (2018 AND 2023)



SOURCE: 4WARD PLANNING, INC. / ESRI

IV. FAIR HOUSING ACT

In 1985, the State enacted the NJ Fair Housing Act (FHA) in response to the “Mount Laurel” decisions of the New Jersey Supreme Court. Per Mount Laurel, each municipality has a constitutional obligation to establish a “realistic opportunity” for providing a “regional fair share of current and future need” for affordable housing. According to the rules of the New Jersey Department of Community Affairs (DCA) governing FHA compliance, affordable units must satisfy the following criteria:

- Units must be sold or rented at prices affordable to income-eligible households, where total housing costs, including rent, mortgage payment, utility costs, taxes, insurance, and association fees, do not exceed 30 percent of gross monthly income for renters and 28 percent of gross monthly income for homeowners.
- Income-eligible households are categorized as moderate, low, and very-low income. Households earning from 50 to 80 percent of the regional median income are categorized as moderate-income; households earning below 50 percent of median income are categorized as low-income households; and households earning below 30 percent of median income are categorized as very low-income households. Figure 4.11 “Affordable Housing Regional Income Limits” provides the income limits for each these classifications for Region 1, which includes Bergen, Hudson, Passaic, and Sussex Counties.
- Units must be made available to all income-eligible households within the region through affirmative marketing and a selection by lottery.
- Units must be restricted to occupancy by income-eligible households for a minimum of 30 years, or 10 years in high-poverty census tracts.

Figure 4.12 AFFORDABLE HOUSING REGIONAL INCOME LIMITS

HOUSEHOLD SIZE	HOUSEHOLD INCOME LIMITS			
	VERY LOW	LOW	MODERATE	MEDIAN
1-person	\$19,079	\$31,798	\$50,878	\$63,597
2-person	\$21,805	\$36,341	\$58,146	\$72,682
3-person	\$24,530	\$40,884	\$65,414	\$81,767
4-person	\$27,256	\$45,426	\$72,682	\$90,853
5-person	\$29,436	\$49,060	\$78,497	\$98,121
6-person	\$31,617	\$52,695	\$84,311	\$105,389
7-person	\$33,797	\$56,329	\$90,126	\$112,657
8-person	\$35,978	\$59,963	\$95,940	\$119,926

SOURCE: NJ DEPARTMENT OF COMMUNITY AFFAIRS (2018)

Since the adoption of the 2004 Master Plan, the NJSEA has taken on an increasingly proactive role in the provision of affordable housing within the District. In a decision dated May 21, 2007, the Appellate Division determined that the NJSEA has a greater responsibility to plan and zone for affordable housing to ensure that constituent municipalities of the District are able to meet their affordable housing obligations.

Additionally, P.L. 2008, Chapter 46, enacted into law on July 17, 2008, states that “regional planning entities are appropriately positioned to take a broader role in the planning and provision of affordable housing based on regional planning considerations.” Regional planning areas, including the Hackensack Meadowlands District, are required to “identify and coordinate regional affordable housing opportunities in cooperation with municipalities in areas with convenient access to infrastructure, employment opportunities, and public transportation.” In addition, new residential development within the District must include at least 20 percent of the units as affordable units, “to the extent this is economically feasible.”

The NJSEA has responded to these mandates in a number of ways, including the implementation of Interim Policies Governing Affordable Housing Development in the Meadowlands District, effective July 24, 2008, and last revised July 27, 2011 (Interim Policies). The Interim Policies, among other things, halt development on sites deemed suitable for residential use unless the applicant meets specified affordable housing requirements; allow increased residential densities and other bonuses to compensate for the lower sale prices or rents required for the affordable units; and ensure that residential development is consistent with all applicable State requirements for affordable housing development. These policies are intended to remain in effect until new legislation is enacted or new administrative rules are adopted that impact affordable housing requirements in the District or otherwise necessitate the reevaluation of the policies, the NJSEA proposes its own rules governing affordable housing, or the policies are withdrawn or rescinded.

V. HACKENSACK MEADOWLANDS DISTRICT FAIR HOUSING MILESTONES

Prior to 2004, constituent municipalities had been assigned an affordable housing obligation by the NJ Council on Affordable Housing (COAH) under “Prior Round” rules for the time period 1987 to 1999. COAH adopted “Third Round” rules in 2004, which employed a growth-share methodology in calculating affordable housing obligations. The following provides a review of affordable housing policy milestones applicable within the District since the adoption of the 2004 NJMC Master Plan:

- On January 11, 2007, the then-NJMC adopted regulations pursuant to the 2004 Master Plan to assist constituent municipalities with meeting their affordable housing obligations under the COAH Third Round rules, whereby petitions for rezoning from municipalities seeking to rezone land within the District to meet their COAH requirements would be accepted, as would applications for variances to allow density increases sought by developers to make affordable housing more economically feasible.
- In a decision dated January 25, 2007 (A-1960/2665/2674/2706-04T3), the Appellate Division of the New Jersey Superior Court affirmed in part, reversed in part, and remanded portions of COAH’s Third Round rules back to COAH for rulemaking. The remanded portions included elements upon which the newly adopted affordable housing rules for the District had been based.
- In a separate decision [IMO Adoption of N.J.A.C. 19:3, 393 N.J. Super. 173 (App.Div.2007)], issued May 21, 2007, the Appellate Division affirmed that the NJMC is authorized to affirmatively plan for affordable housing in the District.
- On August 22, 2007, the NJMC responded to these court decisions by adopting Resolution No. 07-74, which instituted guidelines entitled, Emergency Restraints upon Further Development in the Meadowlands District (with subsequent amendments in 2008). These guidelines were implemented to govern the review of and restraints upon applications for further development in the District until new affordable housing regulations could be developed consistent with COAH’s Third Round rules, which were in the process of being revised at that time. COAH subsequently proposed new rules in the New Jersey Register on January 22, 2008, to address the Appellate Division decision dated January 25, 2007. On May 6, 2008, COAH adopted these new rules, with an effective date of June 2, 2008, and, in addition, proposed amendments to the adopted rules.
- Assembly Bill No. 500/Senate Bill No. 1783 (A-500), an act concerning affordable housing, revising and supplementing various parts of the statutory law, was signed into law on July 17, 2008, by Governor Jon S. Corzine. The law (P.L. 2008, Chapter 46) mandates a 20 percent set-aside for housing development in the State’s regional planning areas, including the Hackensack Meadowlands District.
- The NJMC adopted the Interim Policies Governing Affordable Housing Development in the Meadowlands District (effective July 24, 2008, last revised July 27, 2011) (Interim Policies) to replace the Emergency Restraints in order to avoid losing opportunities for the development of affordable housing in the District while the courts were evaluating the Third Round Rules.
- In a decision issued on October 8, 2010, the Appellate Division invalidated a number of provisions of COAH’s Third Round rules, including its central component, the “growth share” methodology. This decision was later upheld by the New Jersey Supreme Court on September 26, 2013. COAH again drafted revised Third Round rules, based on methodologies used in Round 1 and Round 2, which were to apply to a period commencing on November 17, 2014. However, these rules failed to be adopted.

- Effective August 29, 2011, the statutory powers and duties for administration of the FHA have been consolidated within the DCA, eliminating the 12-member NJ Council on Affordable Housing (COAH). The DCA Office of Local Planning Services facilitates the day-to-day operations of administering the FHA.
- On March 10, 2015, following COAH's unsuccessful efforts to adopt this third iteration of its Third Round regulations, the New Jersey Supreme Court decided that the judiciary would take jurisdiction over the administration of the FHA and would be the entity responsible for evaluating municipal compliance with Mount Laurel obligations (termed Mount Laurel IV). Participating municipalities were instructed to file declaratory judgments by July 8, 2015, in order to secure temporary immunity from exclusionary housing lawsuits while housing plans were being prepared. In many of these cases, the Fair Share Housing Center (FSHC), a non-profit housing advocacy organization, has intervened in the proceedings, and has been involved in negotiating fair share housing settlements.
- Municipalities must adopt a municipal Master Plan Housing Element and Fair Share Plan to receive a Judgment of Compliance and Repose from the Court. The Fair Share Plan is required to include detailed implementation strategies, such as the specific ordinances, plans, timetables, and resolutions needed to carry out the plan.

Most District municipalities are still in the process of determining municipal affordable housing obligations within the judicial system. Within the District, the Interim Policies remain in effect and all development applications are reviewed for compliance with the Interim Policies.

VI. NJSEA INTERIM POLICIES AND SITE SUITABILITY GUIDELINES

The NJSEA has made significant strides in the provision of affordable housing since the 2004 Master Plan, particularly through the implementation of its Interim Policies. The Interim Policies provide a procedure wherein properties that are not zoned for residential use could potentially be deemed suitable sites to accommodate inclusionary housing on a case-by-case basis, in an effort to expand the supply of affordable housing in the District.

Properties located in certain zones, including those regulating the heavier industrial sites and environmentally-sensitive areas of the District, are deemed unsuitable for housing development. Applications for zoning approval in other zones (including new buildings and additions), petitions for rezoning, and new or amended redevelopment plans are subject to evaluation by a review team consisting of NJSEA Professional Planners and Professional Engineers, with optional attendance by a Professional Planner representing the municipality in which the project is located. The review team evaluates each proposal to ensure a potential opportunity for the accommodation of affordable housing is not lost, and prepares a report recommending whether or not the site is deemed suitable for housing for final determination by a vote of the NJSEA Board of Commissioners.

In accordance with the Interim Policies, a site may be deemed suitable for residential development in the District only if it meets all of the following criteria:

1. The site is adjacent to compatible land uses and has access to appropriate streets;
2. The site has access to water and sewer infrastructure with sufficient capacity;
3. The site can be developed consistent with the rules of the NJSEA;
4. Former and existing land uses, either on the site or in the vicinity, may not expose residents to environmental hazard. Alternatively, the site shall be remediated to NJDEP residential standards as a condition of the Board's approval;

5. The size, shape, or layout of any existing structures that shall remain, or other physical limitation(s) not listed previously, do not preclude residential use; and
6. The site is suitable for residential use pursuant to sound planning principles.

The Interim Policies also provide that an applicant may request that the Board of Commissioners evaluate the suitability of a particular site for housing in a zone that does not permit residential dwellings as a principal use. The request must include an assessment of the characteristics of the property in question to demonstrate that the site could be suitable for housing. The NJSEA staff recommendation is forwarded to the Hackensack Meadowlands Municipal Committee (HMMC) for review prior to consideration and a vote by the NJSEA Board of Commissioners.

In addition to the regulatory flexibility applied to the location of housing in the District, the Interim Policies allow for inclusionary housing through an increase in the maximum permitted residential density and density bonuses as an incentive to encourage the development of affordable housing in the District.

The Interim Policies have been implemented with great success, and the expansion of both market rate and affordable housing has been realized in the District as a result. Figure 4.13 “Housing Development within the Meadowlands District (2004-2018)” lists the housing development forming the basis of the 2004 NJMC Master Plan build-out scenario in [Chapter 3 – Land Use](#).

The 2004 NJMC Master Plan build-out scenario had anticipated the development of 3,741 housing units through 2029, of which 416 units were planned to be designated affordable, at approximately 11 percent. This scenario includes housing approved prior to 2004 but not occupied until after 2004 (highlighted in yellow in Figure 4.13), which do not provide affordable units. The build-out goals of the 2004 plan regarding housing have been met by the development of 3,895 units, of which 511, an average of 13 percent, are designated as affordable. Slightly more than half of the affordable units developed in the District since 2004 have been the result of the Interim Policies on sites that were not zoned for residential use (highlighted in blue in Figure 4.13).

The NJSEA remains committed to expanding the availability and affordability of housing in suitable locations in the District, and working in concert with District constituent municipalities to achieve housing goals for the Meadowlands region. Additional evaluation and study are required to prepare a comprehensive housing plan to accommodate the future housing needs of the District. District-specific demographic and housing market data is needed to accurately assess housing needs to develop housing policy and regulations for the District. In the intervening time period, the NJSEA’s Interim Policies and the requirements of A-500 will ensure that no realistic opportunities will be lost for the accommodation of affordable housing in the District.



Figure 4.13 HOUSING DEVELOPMENT WITHIN THE MEADOWLANDS DISTRICT (2004-2018)

PROJECT NAME	MUNICIPALITY	MARKET UNITS	AFFORDABLE UNITS	TOTAL UNITS	% AFFORDABLE
The Monarch <i>40-80 Schindler Court</i>	East Rutherford	284	32	316	10.1%
Vermella <i>340 Orient Way</i>	Lyndhurst	236	60	296	20.3%
The Station at Lyndhurst <i>240 Chubb Avenue</i>	Lyndhurst	153	39	192	20.3%
The Winston at Lyndhurst <i>120 Chubb Avenue</i>	Lyndhurst	174	44	218	20.0%
City View Townhomes <i>734 County Avenue</i>	Secaucus	12	2	14	14.3%
Xchange (Fraternity Meadows) Bldg. A <i>1000 Riverside Station Boulevard</i>	Secaucus	140	38	178	21.3%
Xchange (Fraternity Meadows) Bldg. C <i>3000/5000 Riverside Station Boulevard</i>	Secaucus	240	64	304	21%
Xchange (Fraternity Meadows) Bldg. D <i>7000/9000 Riverside Station Boulevard</i>	Secaucus	270	48	318	15.1%
Xchange (Fraternity Meadows) Bldg. I & J <i>8000 Riverside Station Boulevard</i>	Secaucus	588	0	588	0.0%
Xchange (Fraternity Meadows) Bldg. K <i>200 Riverside Station Boulevard</i>	Secaucus	122	38	160	23.75%
Osprey Cove <i>45 Meadowland Parkway</i>	Secaucus	92	24	116	20.7%
Secaucus Housing Authority <i>158 County Avenue</i>	Secaucus	0	8	8	100.0%
The Harper at Harmon Meadow <i>100 Park Plaza Drive</i>	Secaucus	375	94	469	20.0%
Osprey Cove II <i>34 Meadowland Parkway</i>	Secaucus	49	13	62	20.0%
Axis Development Townhouses* <i>845 First Street</i>	Secaucus	28	7	35	20.0%
The Union (Avalon Bay) <i>1301 Wall Street West</i>	Lyndhurst	328	0	328	0.0%
Sussex Green <i>1625 Paterson Plank Road</i>	Secaucus	26	0	26	0.0%
Riverside Court Townhomes <i>Riverside Drive</i>	Secaucus	212	0	212	0.0%
Liberty Court Townhomes <i>250 Flanagan Way</i>	Secaucus	12	0	12	0.0%
City Homes at Creekside Manor <i>Creekside Court</i>	Secaucus	43	0	43	0.0%
TOTAL UNITS		3,384	511	3,895	AVERAGE 13.11%

* Zoning approvals issued / not yet constructed

- Housing Constructed Pursuant to Site Suitability Approval
- Use Variance to Permit Housing
- Zoning approval issued pre-2004 with occupancy certification received post-2004

VII. CONSTITUENT MUNICIPALITY HOUSING PLANS

A summary of each District municipality’s housing plan and regulatory status as of April 2019 is provided herein. The summary also notes any in-District sites identified within a municipal plan as a potential site to accommodate future affordable housing.

Figure 4.14 “Affordable Housing Obligations by Constituent Municipality” provides the Present Need, Prior Round obligation, Third Round obligation, and Realistic Development Potential for each constituent municipality, based on municipal master plans, fair share plans, and publicly available court filings.

- Present Need quantifies deficient housing units occupied by low and moderate income households as of July 1, 2015.
- Prior Round refers collectively to the First Round (1987 to 1993) and Second Round (1994 to 1999) obligations calculated by COAH. The unfulfilled portion of these obligations continues to apply.
- Third Round obligations are composed of a Gap Period from 1999 to 2015, and a Prospective Need period from 2015-2025.

The “Compliance Period” for municipalities to satisfy need generated under all of these categories is July 1, 2015 to June 30, 2025, matching the ten year period defined in the Fair Housing Act. The Fourth Round begins July 2025. Qualifying Urban Aid municipalities, including Jersey City and North Bergen in the District, are exempt from prospective need affordable housing allocations, based on factors including population density, level of low and moderate housing deficiency, and population density, and, therefore, are not included in Figure 4.14.

Figure 4.14 AFFORDABLE HOUSING OBLIGATIONS BY CONSTITUENT MUNICIPALITY*

MUNICIPALITY	PRESENT NEED	PRIOR ROUND OBLIGATION (1987-1999)	THIRD ROUND (1999-2025)	REALISTIC DEVELOPMENT POTENTIAL (RDP)
Carlstadt	3	228	475	94
East Rutherford	6	90	656	187
Little Ferry	47	28	128	0
Lyndhurst	143	100	1,482	TBD
Moonachie	1	95	11	N/A
North Arlington	23	4	162	
North Bergen	1,213	0	0	N/A
Ridgefield	32	47	348	0
Rutherford	96	95	65	TBD
South Hackensack	35	50	170	29
Teterboro	0	106	5	N/A
Kearny	168	211	0	N/A
Secaucus	57	590	1,266	194

* Only those municipalities marked in bold have received certification of their fair share housing obligation and should be considered final. All other municipal obligations are subject to change.

A. CARLSTADT

On March 27, 2017, the Borough of Carlstadt approved its 2013 Master Plan Reexamination Report. This report addresses the changes in the municipality's affordable housing obligation since the Borough's 2010 Housing Element and Fair Share Plan, which was adopted April 26, 2010. According to the settlement agreement between the Borough of Carlstadt and Fair Share Housing Center (FSHC) dated August 13, 2018, the Borough's obligation is as follows:

- Present Need: 3 units
- Prior Round Obligation (1987-1999): 228 units
- Third Round (1999-2025): 475 units
- Realistic Development Potential (RDP): 94 units

The Borough has made progress in fulfilling its affordable housing obligation. However, pursuant to a builder's remedy litigation filed by the Tomu Development Company, regarding a site located partially in Carlstadt and partially in East Rutherford, the Borough of Carlstadt was assigned a Mount Laurel Implementation Monitor, or "Special Master." The Special Master speaks on behalf of the municipality on all applications for development, requests for land use or building permits, requests for interpretations and appeals. These restrictions are required to remain in effect until further order of the court. The NJSEA also works with the Special Master in reviewing development applications within the in-District portion of Carlstadt.

In 2008, the Borough enacted an ordinance creating three affordable housing overlay zones (AHO-1, AHO-1A and AHO-2) in out-of-District portions of the municipality. A 20 percent inclusionary housing set-aside is required in each overlay district. In addition, a senior citizen housing zone (SCH), also out-of-District, has been established requiring all units within this zone to be affordable. The overlay zones and the SCH zone are included in the Borough's 2010 Housing Element and Fair Share Plan and 2013 Reexamination Report.

B. EAST RUTHERFORD

On May 13, 2019, the Borough of East Rutherford adopted its 2018 Housing Element and Fair Share Plan. This report addresses the municipality's affordable housing obligation in accordance with the terms of an agreement reached between the Borough and the Fair Share Housing Center (FSHC) on July 12, 2015. Through the adoption and implementation of the 2018 Housing Element and the settlement agreement between the Borough of East Rutherford and Fair Share Housing Center dated November 20, 2018, the Borough satisfies the municipal housing obligations for the Present Need, Prior Round (1987-1999) and Third Round (1999-2025), as follows:

- Present Need Obligation: 6 units
- Prior Round Obligation (1987-1999): 90 units
- Third Round Obligation (1999-2025): 656 units (per Kinsey report, as adjusted through the settlement agreement)
- Realistic Development Potential (RDP): 187 units

The Borough of East Rutherford, along with Carlstadt, was party to builder's remedy litigation filed by the TOMU Development Company, regarding a site located partially in each municipality. As a result, the Borough was assigned a Mount Laurel Implementation Monitor, or "Special Master." The Special Master speaks on behalf of the municipality on all applications for development, requests for land use or building permits, requests for interpretations, and appeals. These restrictions are required

to remain in effect until further order of the court. The NJSEA also works with the Special Master in reviewing development applications within the In-District portion of East Rutherford Borough applications within the District.

The Borough of East Rutherford's Housing Element has addressed the Prior Round Obligation of 90 units with two family rental inclusionary projects, as well as associated bonus credits. The unbuilt Tomu Development project will account for 60 units and a bonus 23 units. In addition, the existing Monarch residential development will account for 7 units. Both projects are located within the Hackensack Meadowlands District and are under the NJSEA jurisdiction.

The settlement agreement was approved by the court on January 17, 2019, pursuant to a fairness hearing.

C. JERSEY CITY

Jersey City is a designated Urban Aid Municipality, and does not have a new construction prospective need obligation, but is still responsible for its Present Need Obligation. Information provided by the FSHC indicates that the City's Present Need is 6,496 units. In March 2019, the City released its "Housing Element Update," which provides a review of the City's demographic and housing characteristics.

D. KEARNY

In 2008, the Town of Kearny adopted a Housing Element and Fair Share Plan and a Master Plan Reexamination Report. Both documents addressed the Town's affordable housing obligation and plans for implementation. According to the settlement agreement between the Town of Kearny and the FSHC, dated December 2, 2018, Kearny affordable housing obligation is as follows:

- Present Need Obligation: 168 units
- Prior Round Obligation (1987-1999): 211 units
- Third Round Obligation (1999-2025): 0 units
- Realistic Development Potential (RDP): N/A

The Township discusses working with the NJSEA to determine if sites within the Hackensack Meadowlands District may be suitable for inclusionary residential development. In particular, the Town recommends evaluating sites east of the Township's Transit-Oriented District along Bergen Avenue within the Schuyler Avenue Redevelopment Plan. Kearny also proposes using rehabilitation through participation in the Hudson County rehabilitation program, an affordable housing ordinance, and development fee ordinance to address its affordable housing obligation.

E. LITTLE FERRY

The Borough of Little Ferry and the FSHC entered into a settlement agreement on June 11, 2019, regarding the Borough's affordable housing obligation. Pursuant to this settlement agreement, the Borough's 2016 Master Plan Reexamination Report, and the 2015 "Summary of Plan," the Borough's affordable housing obligation is as follows:

- Present Need Obligation: 47 units
- Prior Round Obligation (1987-1999): 28 units
- Third Round Obligation (1999-2025): 128 units
- Realistic Development Potential (RDP): 0

The Borough's Housing Element and Fair Share Plan, together with its Development Fee Ordinance, Affirmative Marketing Plan, Affordable Housing Ordinance, and River Front Overlay Zone Ordinance, are being utilized to address Little Ferry's affordable housing obligation. The overlay zone, created

in response to a builder’s remedy lawsuit in 2006, is located in an out-of-District portion of the Borough, which permits mixed use development with a mandatory residential component at a density of 25 to 60 units per acre, where 20 percent of units for sale and 15 percent of units for rent must be reserved as affordable.

In the 2019 settlement agreement, an additional site was identified on Washington and Riverside Avenues, located within the District, at a density of 25 to 60 units per acre, where 20 percent of units for sale and 15 percent of units for rent must be reserved as affordable. Pursuant to A-500, inclusionary housing in the District is mandated to include a 20 percent set aside for affordable housing.

The Borough also entered into an agreement with Regan Development Corporation for the development of the property identified as Block 107, Lots 2.01 and 17, and Block 106.01, Lot 13.06, within the District, for the planned development of 65 age-restricted affordable units.

F. LYNDHURST

In 2015, the Township of Lyndhurst adopted a new Housing Element and Fair Share Plan. The plan was developed as a direct result of the March 2015 New Jersey Supreme Court decision regarding all municipalities affordable housing obligation and requiring the submission of a “Summary of Plan” by November 2015. In a 2015 “Summary of Plan” prepared by Eric M. Bernstein & Associates, the Township’s affordable housing obligation is stated as follows:

- Present Need Obligation: 143 units
- Prior Round Obligation (1987-1999): 100 units
- Third Round Obligation (1999-2025): 1,482 units
- Realistic Development Potential (RDP): TBD

The Township has been making progress on their affordable housing obligation, including the addition of a provision in their 2014 Reexamination Plan stating that new residential projects under municipal jurisdiction are to have a 10 percent “set-aside” for affordable units. The Township of Lyndhurst filed a declaratory judgment, which remains under review by the court.

G. MOONACHIE

In 2006, the Borough of Moonachie adopted its 2005 Housing Element and Fair Share Plan. The purpose of this Plan is to establish the municipality’s affordable housing obligation and guidelines and criteria for implementation. According to the 2006 Housing Element and Fair Share Plan and 2007 Master Plan Reexamination Report the Borough estimates the affordable housing obligation to be:

- Present Need Obligation: 26 units
- Prior Round Obligation (1987-1999): 95 units
- Third Round Obligation (1999-2025): 324 units
- Realistic Development Potential (RDP): N/A

H. NORTH ARLINGTON

In 2016, the Borough of North Arlington adopted the most recent Master Plan Reexamination Report; however, its most recent Housing Element and Fair Share Plan, which was adopted in 2003, was included as part of the 2016 Master Plan Reexamination Report. In addition, the State of New Jersey prepared a “Pre-Mediation Report” in 2006 in response to the Borough’s petition for substantive certification. This 2016 report estimates the Borough’s affordable housing obligation to be as follows:

- Present Need Obligation: 23 units
- Prior Round Obligation (1987-1999): 14 units
- Third Round Obligation (1999-2025): 162 units
- Realistic Development Potential (RDP): TBD

The 2006 Pre-Mediation Report addresses the Borough's compliance plan for affordable housing. Unfortunately, this plan references two projects that did not come to fruition. Additionally, the Borough intends to use a "development fee ordinance" and Affordable Housing Ordinance to help with the affordable housing obligation.

The Borough of North Arlington did not file a declaratory judgment.

I. NORTH BERGEN

Adopted in 2009 by the Township of North Bergen, the Housing Element and Fair Share Plan was written to address its affordable housing policy. According to this document, the Township has estimated the following affordable housing needs:

- Present Need Obligation: 1,213 units
- Prior Round Obligation (1987-1999): 0 units
- Third Round Obligation (1999-2025): 0 units
- Realistic Development Potential (RDP): N/A

The Township will satisfy this obligation by seeking credit for an existing age-restricted and inclusionary development, future inclusionary development, and through a project mixing supportive housing with family units.

J. RIDGEFIELD

The Borough of Ridgefield adopted its Housing Element and Fair Share Plan in 2005 and the Master Plan Reexamination Report in 2009. Both documents address the Borough's affordable housing obligation and plans for implementation. According to the 2005 Housing Element and Fair Share Plan, 2009 Master Plan Reexamination Report, and the settlement agreement between the Borough of Ridgefield and the FSHC dated April 23, 2019, the Borough's affordable housing obligation is as follows:

- Present Need Obligation: 52 units
- Prior Round Obligation (1987-1999): 0 units
- Third Round Obligation (1999-2025): 115 units
- Total Obligation: 167 units

The Borough is using the Overpeck Creek Redevelopment Area as a potential area to address affordable housing needs. The redevelopment area does not fall within the jurisdiction of the NJSEA.

K. RUTHERFORD

In 2015, the Borough of Rutherford adopted its Housing Element and Fair Share Plan. This Plan addresses the Borough's affordable housing obligation for Present Need, Prior Round and Third Round. In addition, this plan addresses implementation of affordable housing and a plan for action. According to the 2015 Housing Element and Fair Share Plan, the Borough's obligation is as follows:

- Present Need Obligation: 96 units
- Prior Round Obligation (1987-1999): 95 units
- Third Round Obligation (1999-2025): 65 units
- Realistic Development Potential (RDP): TBD

The Borough is making progress towards its affordable housing obligation through a number of means, including redevelopment areas. The Plan identifies The Maples and the Highland Cross and Kingsland redevelopment areas as sites addressing the obligation. Highland Cross and Kingsland are redevelopment areas located within the jurisdiction of the NJSEA; however, these two redevelopment areas were deemed by the NJSEA to be unsuitable for residential use. In addition to redevelopment, the municipality plans to utilize rent control ordinances, market-to-affordable program, and rehabilitation programs to further address their obligation.

The Borough of Rutherford filed a declaratory judgment action pursuant to the Supreme Court's order in Mount Laurel IV. The Borough and the FSHC have been in negotiations concerning the resolution of the Borough's constitutional compliance; a final agreement has not yet been executed.

L. SECAUCUS

Adopted in 2017, the Town of Secaucus' Fair Share Housing Plan addresses the municipality's Fair Share Housing obligation and plans for implementation. On June 15, 2017, the Town and FSHC entered into a Settlement Agreement to establish the Towns' Present Need, Prior Round Obligation, and Third Round Obligation. A fairness hearing on the Settlement Agreement held on June 15, 2017, confirmed that Secaucus' obligation was as follows:

- Present Need Obligation: 57 units
- Prior Round Obligation (1987-1999): 590 units
- Third Round Obligation (1999-2025): 1,266 units (per Kinsey report, as adjusted through the settlement agreement)
- Realistic Development Potential (RDP): 194 units

The Housing Element and Fair Share Plan identified land within the Xchange at Secaucus Junction development, located near the Secaucus Junction Train Station, as potential land for affordable housing. This parcel is within the NJSEA Secaucus Transit Village Redevelopment Plan (STVRP) and was included as a site with realistic development potential because of continuing efforts made by its parent owners, Atlantic Realty, to secure an increase in total number of units permitted on-site from the NJSEA. Several amendments to the STVRP would be required for the inclusion of 350 total units, including 70 affordable, in the Transition Area, and an additional 500 units, including 100 affordable, in the Riverfront Landing Zone. Further, the plan proposes an additional 125 affordable units within a 625 unit development at the Frank R. Lautenberg Rail Station.

Other sites within the Town accommodating affordable housing in the District include The Harper multifamily rentals developed at Harmon Meadow and the multifamily residential development proposed within the Schmitt Realty Redevelopment Area on Paterson Plank Road.

The Town received final judgment and an order of repose on December 18, 2017.

M. SOUTH HACKENSACK

On November 1, 2017, a settlement agreement was signed by the Mayor of South Hackensack and Kevin Walsh, Esq. representing FSHC. The settlement agreement was approved by the court on February 12, 2018, pursuant to a fairness hearing. The agreement sets forth the extent of South Hackensack's affordable housing obligation and the compliance mechanism by which South Hackensack proposes to address those obligations. In addition to the agreement, the Township adopted a Housing Element and Fair Share Plan in 2017 which confirms the affordable housing

obligation. The 2017 settlement agreement and the 2017 Housing Element state the Township's affordable housing obligation is as follows:

- Present Need Obligation: 35 units
- Prior Round Obligation (1987-1999): 50 units
- Third Round Obligation (1999-2025): 170 units
- Realistic Development Potential (RDP): 29 units

According to the Housing Element, the Township plans on addressing their obligation through the Bergen County housing rehabilitation program and proposed developments such as the Madeline/BCUW 100 percent affordable housing development, which is located out-of-District. The Township will implement an affordable housing inclusionary overlay zoning on select sites within the municipality, which are also outside of the District.

N. TETERBORO

On September 27, 2017, the Borough of Teterboro adopted its 2017 Housing Element and Fair Share Plan. This plan was approved by a Superior Court Judge on April 17, 2017, and was issued a judgment of repose. The purpose of this report was to address the Borough's affordable housing obligation, specifically the Third Round Obligation and the plan for meeting its obligation. According to its 2017 Housing Element and Fair Share Plan, the Borough's obligation is as follows:

- Present Need Obligation: 0 units
- Prior Round Obligation (1987-1999): 106 units
- Third Round Obligation (1999-2025): 5 units
- Realistic Development Potential (RDP): N/A

The Borough has made progress in fulfilling their affordable housing obligation. The construction of Vincent Place, located within the NJSEA jurisdiction, generated five units towards the municipality's obligation. Additionally, Teterboro has implemented an affordable housing plan where 20 percent of the housing stock is deed restricted to low-income households.

The NJSEA addresses strategies to develop a comprehensive housing plan for the District in [Chapter 7- System Plans](#).

ENVIRONMENT

5

5. ENVIRONMENT

The Hackensack Meadowlands, once a wasteland of unregulated dumps and industrial pollution, have staged a remarkable revival since the adoption of the Hackensack Meadowlands Reclamation Act in 1968.

The Environment element of the Master Plan addresses the conditions of the District's defining attribute – the lower Hackensack River watershed and its ecosystem. Together, the District's natural features, including the Hackensack River, its tributaries, and adjoining wetlands comprise approximately 7,590 acres, representing 40 percent of the District's total land area.

Information and updates regarding the following topics are provided in this chapter:

- Waterways
- Wetlands
- Coastal Zone Management
- Floodplains
- Water Quality
- Biota
- Solid Waste
- Water and Wastewater Treatment
- Energy

Although the NJSEA has many successes in preserving and enhancing the natural environment of the District, the Meadowlands remains an ecologically fragile area.

I. WATERWAYS

The Hackensack River originates in Rockland County, New York, and flows approximately 50 miles into Newark Bay at Kearny Point, where the Passaic River also terminates. The Hackensack River is divided by the Oradell Dam at the Oradell Reservoir, which supplies potable water to northern New Jersey communities. The Upper Hackensack River, located to the north of the dam, is freshwater, whereas the Lower Hackensack River, south of the dam, is tidally-influenced brackish water. The Hackensack River watershed totals approximately 197 square miles, of which 137.5 square miles are located in Bergen and Hudson Counties.

Within the District, a number of tributaries flow into the Hackensack River, including but not limited to the following (listed from north to south): Overpeck Creek, Losen Slote, Doctors Creek, Bellmans Creek, Paunpeck Creek, Cromakill Creek, Mill Creek, Moonachie Creek, Bashes Creek, Berry's Creek Canal, Berry's Creek, Kingsland Creek, Sawmill Creek, and Penhorn Creek.

The Meadowlands District includes a number of small freshwater ponds, the largest of which is Mehrhof Pond in Little Ferry, owned by the Bergen County Utilities Authority (BCUA). Mehrhof Pond was formerly a clay pit for a brick manufacturing company that occupied the property until the 1940's. Since the closure of the clay pit, the pond filled in with water and the surrounding areas became naturalized with a mix of native and non-native plant species.

Surface water features of the District are characterized by the many streams, creeks and smaller channels and ditches that drain the area. The quantity and quality of surface water in the Meadowlands is influenced by such factors as tidal flow, precipitation, permitted discharges, and the release or detainment of freshwater from the Oradell Reservoir. Tidal flow in the Meadowlands is such that the system is never completely flushed. By the time the tide in the upper reaches begins to recede, the next incoming tide has begun to enter the lower reaches. In a typical estuary, the freshwater flow maintains a net seaward movement of water mass and any pollutant load. The Hackensack River, however, has a disturbed flow regime; it acts as a trough in which the tidal waters slosh back and forth, only slowly getting flushed to the sea. Open waters and wetlands receive special protection because of Federal and State regulations pertaining to the federal Clean Water Act.

II. WETLANDS

Federal regulatory agencies define wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” (33 CFR Section 328.3 and 40 CFR Section 230.3) Most of the wetlands in the District are brackish and tidally inundated.

Wetlands have important values and perform beneficial functions. Wetlands are “natural capital” that provide benefits to humans in various ways, including Fish and Wildlife values, Environmental Quality values and Socio-Economic values.

The Fish and Wildlife values of wetlands include:

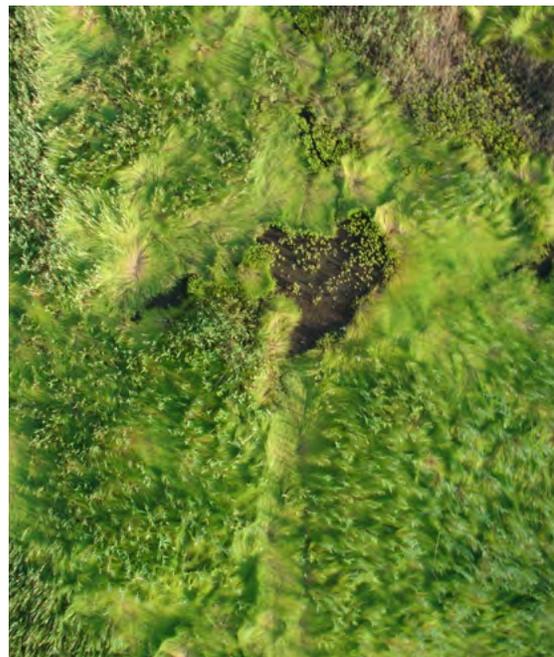
- Fish and shellfish habitat and nutrient sources;
- Waterfowl and other bird feeding and nesting habitat; and
- Furbearer and other wildlife habitat.

The Environmental Quality values of wetlands include:

- Aquatic productivity;
- Water quality improvement;
- Filter pollution;
- Sediment trapping;
- Oxygen production;
- Nutrient recycling;
- Chemical and nutrient absorption;
- Biogeochemical processes;
- Shoreline erosion protection;
- Flood peak reduction;
- Velocity reductions;
- Atmospheric processes; and
- Carbon sequestration.

The Socio-Economic values of wetlands include:

- Flood control;
- Wave damage protection;
- Groundwater recharge;



- Water supply;
- Timber and other natural products;
- Fishing/shellfishing;
- Hunting/trapping;
- Recreation;
- Aesthetics and scenic viewsheds; and
- Education and scientific research.

The dominant wetland type found throughout the Meadowlands and the subject of preservation, mitigation and restoration efforts is tidal brackish marsh, dominated either by common reed (*Phragmites australis*) or smooth cordgrass (*Spartina alterniflora*). These brackish marshes are subject to a wide range of salinity levels. The largest concentration of these wetlands is located in Carlstadt and Lyndhurst. Freshwater wetlands also exist within the District, particularly within the 286-acre Kearny Freshwater Marsh.

The 2004 Master Plan was a landmark achievement in environmental preservation policy for the District. The 2004 plan reclassified large parcels of wetlands, which had been earmarked for development within large specially planned areas, to environmental preservation areas. The 2004 plan approximated 8,400 acres of wetlands and waterways were present in the District, based on an advanced identification (AVID) study of the District begun in the late 1980's. The plan's existing land use analysis classified 7,653 acres as wetlands and waterways, with the balance of wetland areas assumed to be located within parcels classified as other uses. The 2004 plan also indicated 1,800 acres of wetlands were acquired for preservation, and set a goal for the acquisition of 2,600 acres of wetlands with the intent of full public ownership.

The NJSEA's commitment to the preservation, restoration, and management of the District's wetlands and natural areas has resulted in several accomplishments since the adoption of the 2004 plan, including improvements in water quality, habitat creation, and property acquisition for the purposes of preservation, restoration, and mitigation. Pursuant to Figure 5.1 "Acres of Wetland Restoration, Mitigation,

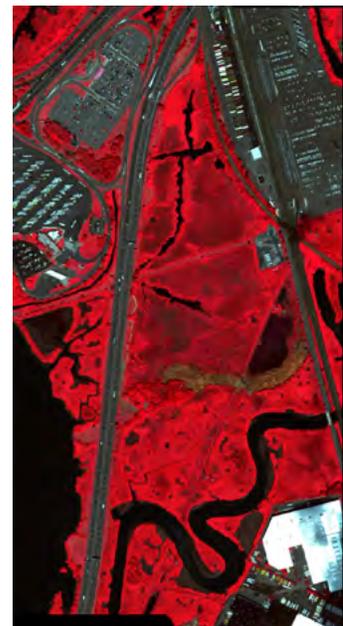
HYPERSPECTRAL IMAGES



LOSEN SLOSE (LITTLE FERRY)



BELLMAN'S CREEK
(RIDGEFIELD/NORTH BERGEN)



MEADOWLARK (RIDGEFIELD)



and Preservation Sites in the Meadowlands District,” a total of approximately 3,544 acres of wetlands in the District has been conserved for preservation, restoration and/or mitigation purposes to date, an increase of 1,066 acres, representing a gain of 43 percent since adoption of the 2004 Master Plan. These figures are based on the inventory of wetlands located in the District, including preserved, restored, and mitigated wetlands, found in Figure 5.2 “Wetland

Restoration, Mitigation, and Preservation Sites in the Meadowlands District.” **Map 7 – Wetland Restoration, Mitigation, and Preservation Sites** depicts the location of each site appearing in Figure 5.2.

The NJSEA coordinates with a number of organizations and agencies in preserving, restoring and managing the Meadowlands’ wetland resources, including its chief partner in these endeavors, the Meadowlands Conservation Trust (MCT). The MCT was established in 1999 to acquire and preserve ecologically valuable lands and to enhance the environment of the Hackensack River watershed. Within the District, the MCT owns and manages the Richard P. Kane Natural Area and Mitigation Bank in Carlstadt and South Hackensack, Western Brackish Marsh in Secaucus, Eastern Brackish Marsh in North Bergen, and the Skeetkill Marsh in Ridgefield. The MCT also owns and/or manages a number of other environmentally sensitive properties outside the District boundaries. The NJSEA and/or the MCT hold ownership, lease, or management rights to more than three quarters of these sites, totaling approximately 2,688 acres.

Figure 5.1 ACRES OF WETLAND RESTORATION, MITIGATION, AND PRESERVATION SITES IN THE MEADOWLANDS DISTRICT

WETLAND SITE CATEGORY	PRE-2004* TOTAL ACRES	2019 TOTAL ACRES	ADDITIONAL WETLAND ACRES SINCE 2004
Restoration/Mitigation Sites	499.7	617.1	117.4
Mitigation Banks	208.7	481.3	272.7
Preservation Sites	1,769.5	2,445.8	676.3
TOTAL ACRES	2,477.9	3,544.2	1,066.4

*Includes area of Secaucus High School Wetland Enhancement Site (#16), Kearny Freshwater Marsh (#31), and Kearny Brackish Marsh (#32) in Figure 5.2. Although restoration and/or acquisition was completed post-adoption of the 2004 NJMC Master Plan, these sites were designated as wetland enhancement sites in the 2004 plan.

Figure 5.2**WETLAND RESTORATION, MITIGATION, AND PRESERVATION SITES
IN THE MEADOWLANDS DISTRICT**

	RESTORATION/MITIGATION SITES	LOCATION	SIZE (ACRES)	YEAR RESTORED
1.	Vince Lombardi Mitigation Site	Ridgefield	12.8	1983
2.	Western Brackish Marsh Mitigation Site +	Secaucus	68.1	1985-1987
3.	Eastern Brackish Marsh Mitigation Site +	North Bergen	61.6	1985-1987
4.	Hartz Mountain - Bellman's Creek Mitigation Site	North Bergen	6.5	1988
5.	Hartz Mountain - Mill Creek Mitigation Site	Secaucus	4.0	1988
6.	Hartz Mountain - Cromakill Creek Mitigation Site	North Bergen	28.1	1988
7.	Hartz Mountain - Carpet Mountain Mitigation Site	Secaucus	3.9	1988
8.	Bellmead Mitigation Site +	Lyndhurst	24.6	1989-1990
9.	Hess Mitigation Site	Secaucus	2.8	1995
10.	Russo Ponds Mitigation Site	Carlstadt	3.3	1996
11.	Skeetkill Creek Marsh Mitigation Site +	Ridgefield	17.0	1998
12.	Harrier Meadow Wetland Enhancement Site +	North Arlington	68.4	1998
13.	Eighty Associates Wetland Mitigation Site	East Rutherford	3.1	1999
14.	Mill Creek Marsh Wetland Enhancement Site +	Secaucus	139.6	1999-2000
15.	WLIB Radio Towers Wetland Mitigation Site	Lyndhurst	1.1	~2001
16.	EnCap Wetland Mitigation Site +	Rutherford	32.4	2004-2005
17.	FD&P Mitigation Site	Secaucus	30.8	2006
18.	Secaucus High School Wetland Enhancement Site*	Secaucus	43.0	2007
19.	Richard P. Kane Freshwater Wetland Mitigation Site +	Carlstadt & South Hackensack	19.5	2010
20.	Global Terminals Wetland Mitigation Site	Carlstadt	15.2	2012
21.	NYS&W RR Mitigation Site	North Bergen	2.0	2013
22.	Hurricane Associates - Frank's Creek Mitigation Site	Kearny	1.2	2014
23.	Pan-Am Freshwater Wetland Mitigation Site	Moonachie	11.7	1990
24.	FFA Mitigation Site	Little Ferry	13.2	Not Constructed
25.	Hudson Co. Improvement Authority	Kearny	0.9	2009
26.	NJSEA Mitigation	Jersey City	1.1	2009
27.	Norfolk Southern Railway Company	Kearny	0.6	2009
28.	Rockefeller Group Development Corp.	Jersey City	0.6	2012
	WETLAND MITIGATION BANKS	LOCATION	SIZE (ACRES)	YEAR RESTORED
29.	Marsh Resources Inc. Meadowlands Mitigation Bank - Phase I and II	Carlstadt	208.6	1999-2001
30.	Richard P. Kane Tidal Wetland Mitigation Bank+	Carlstadt & South Hackensack	223.0	2010-2012
31.	Evergreen Environmental - MRI Phase III Wetland Mitigation Bank	Carlstadt	49.7	2012

Figure 5.2 cont. WETLAND RESTORATION, MITIGATION, AND PRESERVATION SITES IN THE MEADOWLANDS DISTRICT

WETLAND PRESERVATION SITES		LOCATION	SIZE (ACRES)	YEAR ACQUIRED
32.	Riverbend Wetland Preserve +	Secaucus	54.0	1996
33.	Anderson Creek Marsh +	Secaucus	54.3	1976
34.	Oritani Marsh +	East Rutherford	221.9	1998
35.	Lyndhurst Riverside Marsh Preserve +	Lyndhurst	27.8	1999
36.	Kearny Freshwater Marsh +	Kearny	285.7	2004
37.	Kearny Brackish Marsh +	Kearny	110.2	2005
38.	Kingsland Impoundment +	Lyndhurst	80.5	1990
39.	Walden Swamp +	East Rutherford	143.6	1972
40.	Berry's Creek Marsh +	Rutherford	77.2	2011
41.	Hawk Marsh +	Secaucus	34.8	2008
42.	North Bergen Wetlands +	North Bergen	18.9	2006
43.	Richard P. Kane Wetland Site +	Carlstadt	334.8	2005
44.	Sawmill Creek Wildlife Management Area**	Kearny & North Arlington	757.2	1974/1998
45.	Meadowlark Marsh +	Ridgefield	92.9	2004
46.	Metromedia Marsh +	Carlstadt	99.6	2003
47.	Murray Hill Parkway Properties +	East Rutherford	12.3	2004
48.	Losen Slote Park*	Little Ferry	25.9	1975
49.	Snipes Park Wetlands+ <i>(jointly owned with Town of Secaucus)</i>	Secaucus	14.1	1977
TOTAL ACRES			3,549.1	

+ Owned by NJSEA or Meadowlands Conservation Trust
 * Leased to NJSEA for a 99 year period
 ** NJSEA granted management rights for a 30 year period

SOURCE: NJSEA AND MERI GIS

There are also a number of significantly-sized wetland parcels that are held under private ownership, or are owned wholly or in part by other public or quasi-public entities within the District, that do not appear in Figure 5.2, as they are not under NJSEA or MCT ownership. A total of 6,213 acres of the District’s land area has been classified within the Wetland category in the existing land use analysis in [Chapter 3 – Land Use](#), although additional wetlands are present on portions of land classified within other land use categories, such as those located within transportation and utility rights-of-way.

The need for wetlands mitigation stems from the Federal Clean Water Act, which stipulates that there must be compensation for the loss of any wetlands. For example, if a project proposes the filling of wetlands, other wetlands are required to be created or existing wetlands are required to be restored or ecologically enhanced as a condition of receiving a permit for the wetlands fill. Mitigation ratios are set by the USACE and may be based on the quantity of mitigation required and the quality of mitigation offered. Wetland mitigation, restoration, and enhancement efforts involve restoring a former or degraded

wetland's physical, chemical, or biological characteristics to assist recovery of its natural function. These efforts may include restoring tidal flow, removing fill, creating open water areas, and controlling invasive species.

The NJSEA works with the Meadowlands Interagency Mitigation Advisory Committee (MIMAC), which was established in 1997 to provide for interagency reviews of mitigation requirements for projects impacting wetlands within the Meadowlands District. MIMAC, now known as the Meadowlands Interagency Review Team (IRT), includes representatives of the US Army Corps of Engineers (USACE) and the New Jersey Department of Environmental Protection (NJDEP) – the principal environmental permitting agencies – along with representatives of the NJSEA, the USEPA, the US Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration (NOAA) Fisheries, also known as the National Marine Fisheries Service. The IRT provides a framework for interagency review of Meadowlands wetland mitigation proposals, including the use of mitigation banks, to ensure that regulatory requirements concerning compensatory mitigation within the Meadowlands District are carried out.



The NJSEA has also participated as a local sponsor of USACE's Hudson Raritan Estuary (HRE) Ecosystem Restoration Study. Since the Meadowlands represents the largest brackish tidal wetland complex remaining within the HRE, the Meadowlands was identified as a priority area. The purpose of the HRE study was to identify and document water resource related problems, existing conditions, and factors contributing to environmental degradation within

the estuary to develop potential solutions aimed at ecosystem restoration. The overall objective of the HRE is to restore ecological function and diversity that have been lost or degraded as a result of human activities. An early product of the restoration study for the Hackensack Meadowlands was the May 2004 Meadowlands Environmental Site Investigation Compilation (MESIC), an annotated bibliography of studies and literature pertaining to the Meadowlands and the specific sites within the Meadowlands that were being considered as candidates for restoration. Another product of these efforts was the August 2005 Draft Meadowlands Comprehensive Restoration Implementation Plan (MCRIP). The MCRIP included a review of existing conditions, a screening of alternative restoration measures, and an implementation plan for use in restoring Meadowlands wetlands. The Final MCRIP was published by the USACE in December 2010. In August 2012, the Hackensack Meadowlands study was merged with the overall HRE Feasibility Study. The Final HRE Comprehensive Management Plan was published in June 2016, and includes two planned USACE restoration sites in the Meadowlands, the Metromedia Marsh in Carlstadt and the Meadowlark Marsh in Ridgefield.

The NJSEA coordinates with a number of other governmental groups, including the NJDEP Division of Science and Research, as a member of the NJ Tidal Wetland Monitoring Network; the NY-NJ Harbor and Estuary Program, as a member of the Restoration Working Group; and with The Waterfront Alliance, as a

member of the Resilience Task Force. The NJSEA also works with a number of environmental stakeholders including non-profit organizations such as the Bergen County Audubon Society, Hackensack Riverkeeper, and NY-NJ Baykeeper, and with a number of universities including Rutgers University, Ramapo College of NJ, Montclair State University, and New Jersey City University. These collaborations are important to coordinate efforts in the mutual endeavor to preserve and protect the Meadowlands environment.

III. COASTAL ZONE MANAGEMENT

In 1972, the Federal Coastal Zone Management Act (16 U.S.C. 1450) (CZMA) was passed to address development within coastal areas and to ensure coastal area's natural resources are properly managed. The National Coastal Zone Management Program (CZMP), which fosters cooperation in the planning and management of coastal areas between coastal states and the Federal government, is administered by NOAA. Pursuant to the CZMA, the District is identified by New Jersey's Coastal Management Program (CMP) as a Geographic Area of Particular Concern. New Jersey's CMP is administered by the NJDEP. The NJDEP and the NJSEA coordinate the review of proposed development and other activities within the District through the process outlined in N.J.A.C. 7:7-9.43 and a Memorandum of Agreement between the two agencies dated November 9, 2005. As specified in the State's CZM rules, the District's Master Plan serves as an element of the State of New Jersey's CMP for areas within the Hackensack Meadowlands District. Pursuant to these rules, the NJSEA is the lead planning and management agency within the District, a coastwide special area, and coastal activity or development in the District must be consistent with the District's Master Plan.

IV. FLOODPLAIN MANAGEMENT

The floodplains of the Meadowlands are low-lying areas generally located adjacent to waterways and wetlands in the District. Because these areas are low in elevation, flooding is in one of the prevailing concerns impacting District property owners. Flooding in the District can be characterized as fluvial, tidal, and pluvial:

- Fluvial, also known as riverine, floods are caused by excessive precipitation over an extended time period that causes a river to exceed its capacity.
- Tidal flooding results in temporary inundation of lands which may occur on a more frequent basis than riverine flooding, based on the high tide cycle. The mean range from low tide to high tide measured at the Portal Bridge, which spans the Hackensack River between Kearny and Secaucus, is approximately 5.27 feet. When tide levels are high and significant rainfall occurs, tidal flooding can impact the effectiveness of urban drainage systems.
- Pluvial, surface water floods occur when excessive precipitation creates a flood event unrelated to a water body, such as when the rate of precipitation exceeds the capacity of a drainage system to accommodate the volume of precipitation.

The Federal Emergency Management Agency (FEMA) produces Flood Insurance Rate maps (FIRMs) which provide the base flood elevations (BFE) for properties within a designated FEMA Special Flood Hazard Area (SFHA). Properties in the District have BFEs ranging from 5 to 10 feet pursuant to the effective FIRM dated September 30, 2005, which uses the National Geodetic Vertical Datum of 1929 (NGVD29). (See [Map 8 – FEMA Special Flood Hazard Areas.](#)) More than three-quarters of the District is located within a designated FEMA SFHA, defined as an area that will be inundated by a flood event having a one

percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year flood. Based on the 2005 FIRMs, approximately 14,728 acres of the District are located within a 100-year floodplain within FEMA Zones A and AE, with another 263 acres within the 500-year floodplain (having a 0.2 % annual chance of flood). The District is located within FEMA Region II, along with the rest of New Jersey, New York, Puerto Rico, the US Virgin Islands, and eight Tribal Nations.

FEMA published new Preliminary FIRMs as of August 29, 2014, which included updated elevations that accounted for coastal storm surge elevations. In many cases, the BFE increased for properties in the District. FEMA's 2014 Preliminary FIRMs also changed the datum of the maps to the more-accurate North American Vertical Datum of 1988 (NAVD 88).

The City of New York appealed the Preliminary FIRMs designations in 2015. FEMA announced this appeal was successful on October 17, 2016, and, as a result, the new FIRMs will not be adopted until the coastal flood maps have been revised. FEMA has estimated that these 2014 Preliminary FIRMs will be adopted in 2024.

As an interim measure to bring Bergen County and the Meadowlands District into conformance with the rest of the state in regards to the vertical datum, another set of Preliminary FIRMs has been published. These maps maintain the current BFE from the 2005 Effective FIRMs and simply update the datum from NGVD29 to NAVD 88. These 2019 FIRMs also include updated riverine modeling of Overpeck Creek at the northeast corner of the District. These maps will be adopted and become effective on August 28, 2019.



The District's zoning regulations require that all structures located in a SFHA have a finished floor elevation at a minimum of one foot above the FIRM's established base flood elevation. Where the BFE on the Preliminary FIRM differs from the BFE on the Effective FIRM, the NJSEA utilizes the best available flood hazard data, i.e., whichever elevation

is more restrictive, plus one foot, to establish the minimum finished floor elevation.

The NJSEA participates in FEMA's National Flood Insurance Program (NFIP) Community Rating System (CRS). The CRS was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum standards by reducing flood insurance premiums for the community's property owners. The NJSEA has participated in the CRS since 1992, and the District is certified as a Class 7 community, which qualifies flood insurance policy holders in a SFHA within the Hackensack Meadowlands District to a 15 percent discount in their flood insurance rates. In order to maintain the discount, the NJSEA is required to administer, and to verify annually with the NFIP, activities in the District, which include, but are not limited to, flood data maintenance (such as elevation certificates), open space preservation, community outreach projects, map information services, upholding stormwater management standards, and drainage system maintenance.

Figure 5.3 "Water Control Methods for the Hackensack River and its Tributaries within the Hackensack Meadowlands District" lists the flood control method for the waterways in the District.

Figure 5.3 WATER CONTROL METHODS FOR THE HACKENSACK RIVER AND ITS TRIBUTARIES WITHIN THE HACKENSACK MEADOWLANDS DISTRICT

WATERWAY	WATER CONTROL METHOD
Hackensack River	Dam (at Oradell Reservoir)
Penhorn Creek	Tide gate
Losen Slote	Pump Station
Anderson Creek	Open to the tides
Sawmill Creek	Open to the tides
Kingsland Creek	Tide gate
Berry's Creek Canal	Open to the tides
Bashes Creek	Tide gate
Moonachie Creek	Tide gate
Mill Creek	Open to the tides
Cromakill Creek	Open to the tides
Bellman's Creek	Open to the tides
Overpeck Creek	Tide gates
Berry's Creek	Open to the tides
Peach Island Creek	Tide gate (limited functionality)
DePeyster Creek	Tide gate/Pump Station
West Riser Ditch	Tide gate
East Riser Ditch	Tide gate

SOURCE: NJSEA

The following is a summary of activities implemented to mitigate flood impacts in the District:

A. COLLECTION AND ASSESSMENT OF FLOODING INCIDENTS

The NJSEA continues to actively collect, log and assess flooding complaints on individual properties, including inspecting the District for flood impacts following severe storms. NJSEA staff engineers regularly meet with property owners for on-site inspections and to discuss drainage options.

B. DRAINAGE SYSTEM MAINTENANCE (TIDE GATES, PUMP STATIONS, WATERWAYS)

The NJSEA annually inspects the functionality of all 29 tide gates and pump stations and 15 major drainage ditch systems in the Meadowlands District. Seven of the tide gates are monitored on a continuous basis through the use of pressure transducers located immediately upstream and downstream of the tide gates. These transducers provide data on the water depth on both sides of the tide gates which is transferred via 4G LTE telemetry to NJSEA servers. The field units are self-contained and are solar/battery powered. Since the District is tidally influenced, routine inspection of tide gates and pump stations is important to identify issues that could impact flood protection for upstream areas. The NJSEA inspects tide gates during various tide conditions in order to accurately identify problems or determine maintenance that may be required. Pump stations are inspected with the respective municipality's Department of Public Works (DPW) to ensure the systems are operating properly. Additionally, waterways and ditches are inspected throughout the District to ensure adequate stormwater conveyance capacity. The NJSEA also coordinates with municipal and county DPWs to remove stream debris. These inspections and maintenance activities have assisted in lessening the effect of several major storms.

C. MUNICIPAL EQUIPMENT POOL

The maintenance of storm sewer systems is critical to ensure adequate stormwater carrying capacity. The NJSEA provides and maintains equipment for use by municipal workers to assist municipalities in the District with maintenance issues that, if neglected, could exacerbate flooding. A jet vac-truck, root cutter, portable automatic self-priming pump systems, and trailer-mounted light tower are available to municipalities free of charge to encourage maintenance of storm sewer systems.

D. MONITORING WATER LEVELS IN THE DISTRICT

The NJSEA, in conjunction with MERI, continuously monitors water levels in the District via state-of-the-art data collection instruments stationed at tide gates, in the marshes, and in the Hackensack River, including a total of 17 water level sensors. MERI and the NJSEA also maintain, update, and upgrade the monitoring equipment as needed. Data collected from the monitoring stations are relayed to the NJSEA/MERI via 4GLTE telemetry. The information gathered is relayed to international



servers to ensure that data is available to the public in real time, even during power outages in the Meadowlands area. The active monitoring of water levels allows municipalities and the general public to be alerted of potential flooding events through MERI's Flood Warning Systems. This ensures that timely warning can be provided to first-responders and residents when water levels rise during tidal events, heavy rains, and storms.

E. FLOOD WARNING SYSTEMS

Through the Meadowlands Environmental Research Institute (MERI), the NJSEA offers a water alert system and flood maps to first responders and the public. The email and text-based alerts for municipalities in the Meadowlands District are issued when water levels reach 5.5 feet (NAVD88) above sea level and continue to be relayed as the levels rise. The interactive, web-based flood prediction maps illustrate the portions of the Meadowlands District which may flood at sea surge levels ranging from 4 to 8 feet above sea level. The system includes an automated warning to all emergency responders in the District in the advent of a major, six-foot flood.

F. PALMER TERRACE TIDE GATE AND ASIA PLACE DITCH CLEANOUT (2007)

This flood control project included the restoration of several drainage systems in Carlstadt and Moonachie between Washington Avenue and Gotham Parkway. NJSEA engineers designed the improvements, including a new tide gate on Palmer Terrace in Carlstadt and 4,500 linear feet of ditch cleanout in the Asia Place ditch system. This \$340,000 project serves to better manage tidal impacts on industrial and commercial properties west of Washington Avenue.

G. ROUTE 17 PROJECT (2009-2010)

This flood control project, which was undertaken to relieve flooding on Route 17 in East Rutherford and Rutherford, was a joint effort involving the NJSEA, County of Bergen, and the New Jersey Department of Transportation (NJDOT). The first phase of the project included the installation of a dozen culverts, and the installation of new tide gates (Rutherford and East Rutherford tide gates) to better control flow to and from the Hackensack River via Berry's Creek. The project also included the clearing of a drainage ditch that conveys runoff from Route 17 and adjacent properties to the new tide gates. Another phase of the project included the NJDOT installation of drainage pipes at the Route 17 low point and upgrading the existing roadway stormwater system. These collective

improvements, at a cost of \$5.5 million, help to minimize tidal flooding and storm surges from flowing upstream to the highway and from impacting commuters, businesses, and residents in the area.

H. MOONACHIE AND BASHES CREEK TIDE GATES (2010)

This flood control project included the installation of two new tide gates in Carlstadt located near the Hackensack River at the Bashes Creek and Moonachie Creek culverts that cross under the New Jersey Turnpike's Western Spur. These improvements, at a cost of \$414,000, help to address tidal surges from impacting the industrial area located east of Washington Avenue. The tide gates were outfitted with solar-powered sensors that allow remote monitoring of the gates' operations.

I. WEST RISER TIDE GATE (2014)

This flood control project, located along the West Riser Ditch on the border of Moonachie and Wood-Ridge, included the installation of a new tide gate structure with a trash rack system to replace the original 1977 structure. The \$1,249,800 project was partially funded by a \$551,800 grant from the Port Authority of New York and New Jersey (PANYNJ), with the NJSEA funding the remaining balance. This project helps to better protect residential, commercial, and industrial properties in Moonachie, Carlstadt, Wood-Ridge and Teterboro, including Teterboro Airport, from daily tidal flooding from the Hackensack River via Berry's Creek.

J. WETLAND ACQUISITION

To accommodate floodwater storage and maintain natural buffer areas between the river and the developed areas, the NJSEA and the MCT continue to acquire critical tracts of wetlands. To date, approximately 3,500 acres of wetlands have been preserved and/or restored to help dissipate storm events and tidal flows. According to the US EPA, an acre of wetland can store between 1 and 1.5 million gallons of floodwater. The NJSEA has expended tens of millions of dollars acquiring, preserving, and maintaining wetland properties.



In 2005, the NJMC adopted the Hackensack Meadowlands Floodplain Management Plan (FMP), which provided multi-step, coordinated initiatives to be undertaken by the agency to address flooding in the District. The projects implemented in accordance with the FMP have made demonstrable progress in effectively addressing flooding in the District. The FMP is currently being updated for adoption in 2021.

This Master Plan recognizes that climate change and rising sea levels will translate into an increase in the severity and frequency of flooding in the District. Prior to 2012, there were fewer than 10 repetitive loss properties in the District. After Superstorm Sandy in October 2012, the number of repetitive loss properties in the District increased to 119, when the storm's sea surge inundated the District after water levels exceeded the top of bank and flood control berms by over 3 feet in areas. The NJSEA is providing additional detail about the prospective effect of climate change and resiliency methods in [Chapter 9 – Sustainable Meadowlands: A Guide to Resiliency](#).

V. WATER QUALITY

Water quality in the District is influenced significantly by urbanization and industrialization. The lower Hackensack River is not as well flushed as other estuaries because of its limited freshwater inflow and indirect link with the open ocean. Consequently, the District’s water quality is susceptible to pollutants introduced into the watershed. There are many existing point and non-point sources of pollution, which affect the present water quality. Point sources of pollution tend to come from activities such as sewage treatment plants and industrial discharges. Non-point sources of pollution cannot be pinpointed to the initial discharging source and include storm sewers, landfills, leachate, and surface runoff.

The NJDEP provides standards for surface water quality and criteria required to meet these standards. The NJDEP has classified different reaches of the Hackensack River according to the surface water quality standards. The classifications are summarized in Figure 5.4 Hackensack River Network Surface Water Classification in the District.

Figure 5.4 HACKENSACK RIVER NETWORK SURFACE WATER CLASSIFICATION IN THE DISTRICT

RIVER SEGMENT	CLASSIFICATION
Overpeck Creek to Routes 1 & 9 Bridge	SE2
Tributaries joining the main stem downstream of Overpeck Creek	FW2-NT/SE2

CLASSIFICATION TERMS

- **SE** = Saline Estuaries. This general surface water classification applies to saline waters of estuaries.
- **SE2** = Saline Estuaries 2. These are waters designated for the following uses: maintenance, migration, and propagation of the natural and established biota; migration of diadromous fish; maintenance of wildlife; secondary contact recreation; and any other reasonable uses.
- **FW** = Fresh Water. This general surface water classification applied to fresh waters.
- **FW1** = Fresh Water 1. Correspond to fresh waters that are to be maintained in their natural state of quality (set aside for posterity) and not subjected to any man-made wastewater discharges or increases in runoff from anthropogenic activities.
- **FW2** = Fresh Water 2. This general surface water classification applies to those fresh waters that are not designated as FW1 or Pinelands Waters.
- **NT** = Nontrout waters

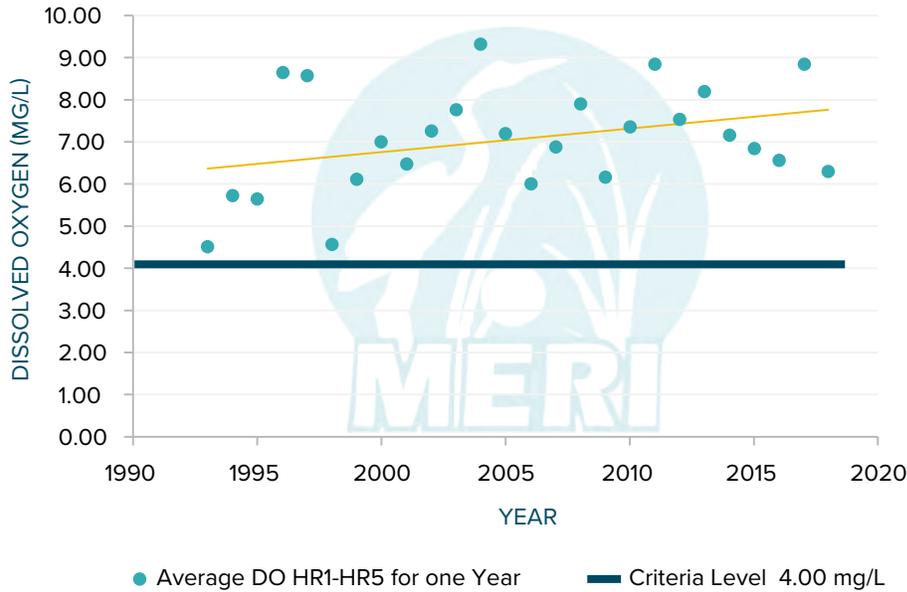
SOURCE: NJ SURFACE WATER QUALITY STANDARDS, N.J.A.C. 7:9B

Since 1993, water quality within the District has been monitored seasonally (four times per year) from fourteen sites in the District, including five sites along the Hackensack River. The NJSEA works in close partnership with the Meadowlands Environmental Research Institute (MERI) to conduct research on various environmental characteristics of the Hackensack River estuary, including water quality monitoring. The data that results from this monitoring program is submitted to NJDEP and becomes part of the NJ Water Quality Summary Report (Clean Water Act, 305b and 305d). It is also shared with the USEPA through the Water Quality Exchange system (WQX).

Samples are analyzed for the levels of dissolved oxygen, pH, temperature, and salinity; the presence of heavy metals, including cadmium, chromium, copper, iron, lead, nickel, and zinc; nutrients; suspended solids; and bacteria. Although concentrations vary widely among seasons and from year to year, sampling results over the past 25 years show consistently improving trends in overall water quality.

The level of dissolved oxygen (DO) is an important indicator of water quality, as proper DO levels in the water are necessary to support the maintenance, migration and propagation of the natural and established biota. For instance, wet years with increased run-off produce lower concentrations of DO. DO readings collected during the NJSEA’s seasonal monitoring (1994-2018) showed that 80 percent of the measurements were above the minimum standard of 4.0 mg/L since 1997, and continue to improve. The trendline in Figure 5.5 “Dissolved Oxygen Concentrations in the Lower Hackensack River” indicates a steadily increasing average DO concentration, signifying steady improvements to water quality in the District.

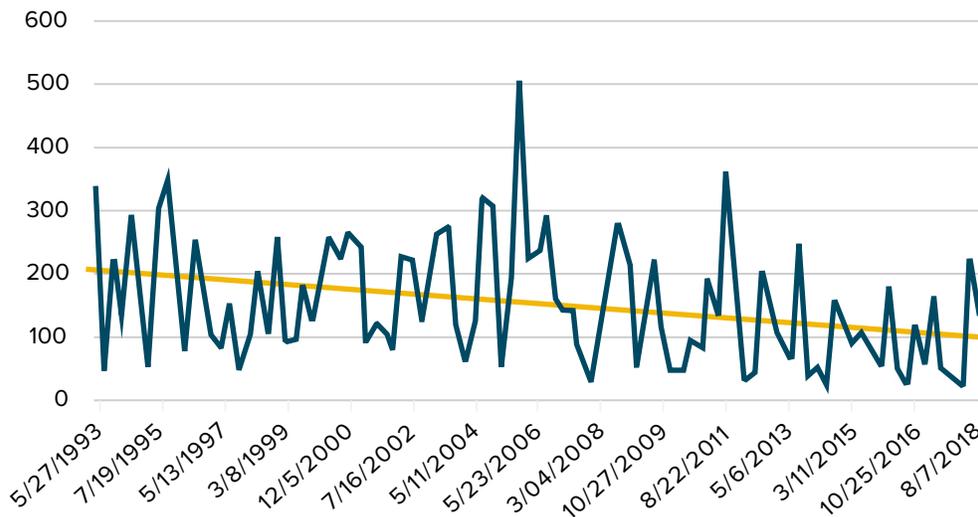
Figure 5.5 DISSOLVED OXYGEN CONCENTRATIONS IN THE LOWER HACKENSACK RIVER



SOURCE: MERI, DECEMBER 2018

Likewise, the presence of fecal coliforms, indicators of untreated sanitary waste, has decreased over time. The trendline in Figure 5.6 “Average Fecal Coliforms” shows that fecal coliform concentrations have decreased by half, from 200 to 100 fecal colonies/100 mL within this time period.

Figure 5.6 AVERAGE FECAL COLIFORMS



SOURCE: MERI, DECEMBER 2018

Heavy metals are by-products of industrial processes, power generation and the transportation arteries throughout the District and are mainly deposited in the sediments of the estuary. A study of heavy metals in the sediments on the bottom of the Hackensack River entitled “Chemical Characteristics of Sediment Collected as Part of the Fishery Resource Inventory of the Lower Hackensack River within the Hackensack Meadowlands District: A Comparative Study 2001-2003 & 1987-1988” (Konsevick, E., and Bragin, A. B.),

released in 2007, examined sediment at locations throughout the Upper, Lower and Middle portions of the Hackensack River and its tributaries. Samples of surface mud were collected at 26 locations, following the methodology of a previous study done by the then-HMDC in 1987. The samples were analyzed for cadmium, chromium, copper, lead, nickel and zinc. Additional to the original study, sediment concentrations of mercury, arsenic, and iron were also examined. The texture of bottom sediments had not changed greatly during the 15-year interval between studies and the sediment quality had clearly improved. Between 1987 and 2003, the average sediment concentration of cadmium, chromium, copper, lead and nickel was reduced by between 22 percent and 71 percent. Criteria established to measure the adverse biological effects of the metals on an ecosystem revealed chromium, copper and nickel had shifted from hazardous to acceptable levels since 1987. Mercury was the only metal remaining at a high concentration level; however, no significant difference in mercury concentration was reported at different points along the river.

In a forthcoming study by MERI, due to be released in late 2019, the Secaucus High School wetlands enhancement site, a closed site that was subsequently reopened to the tides, was monitored for a period of ten years to determine if contaminants in area waterways would migrate and re-contaminate restored tidally-influenced wetlands. Sampling data indicates that point-source pollution in the Hackensack River and adjoining waterways remains stable, and that there has been no significant migration of existing contaminants in area waterways to the restored site as a result of the tides. This indicates that overall heavy metal concentrations in the sediments of the estuary have not significantly increased or decreased between 2007 and 2018. Metal contaminants move closer to the surface in wet years and deeper into the sediments during drought years. This movement creates what appear to be spikes in concentration during rainy years that are then off-set by drought years. The only contaminant that appears to have increased over time is mercury on surface sediments, which results mainly from aerial deposition.

VI. BIOTA

The wetlands and waterways of the District support an extensive ecosystem of biodiversity in the District. Water quality improvements in the District are contributing to the improved overall health of the District's ecosystem, as are the wetland and other habitat restoration efforts that the NJSEA has undertaken. Numerous biological studies conducted in the Meadowlands since the 1970's show that the various habitats found within the District support more than 470 species of vascular plants, approximately 114 species of benthic macroinvertebrates, four species of amphibians, 12 species of reptiles, over 50 species of fish, approximately 288 species of birds, and 27 species of mammals.

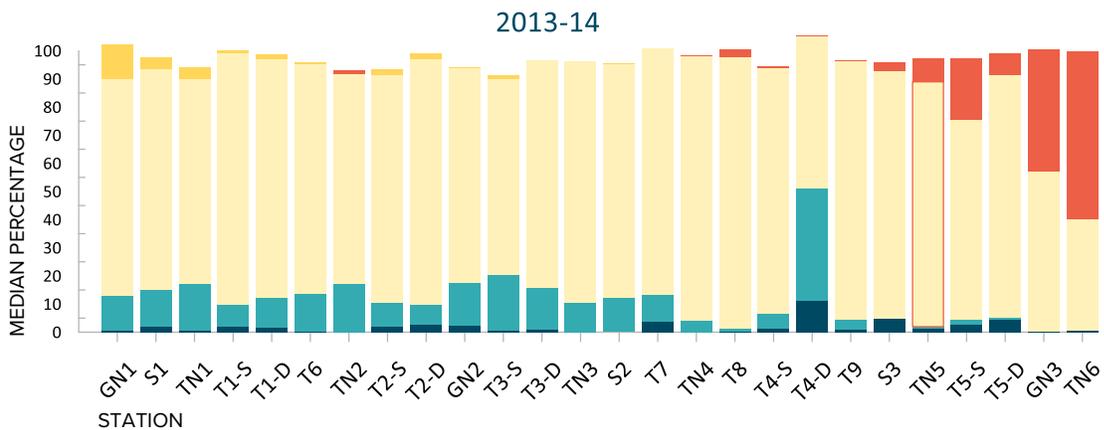
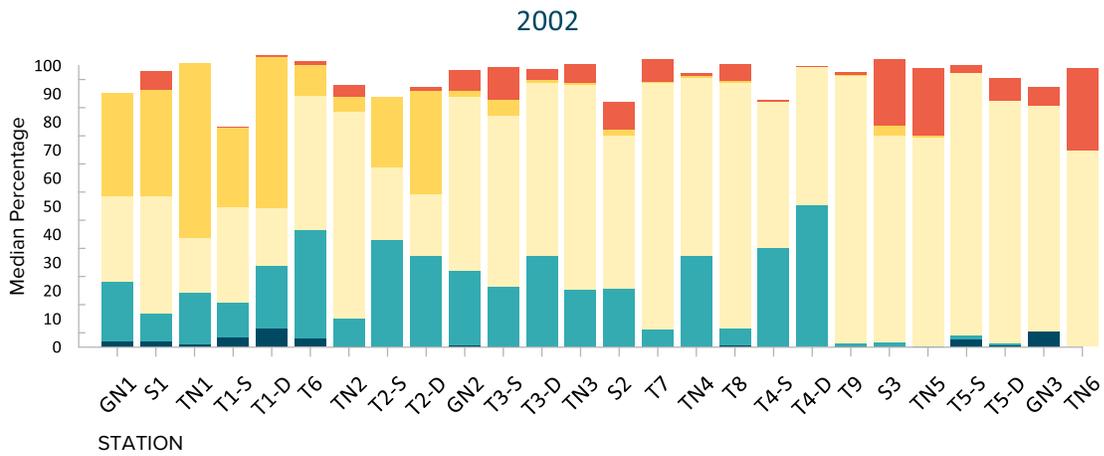
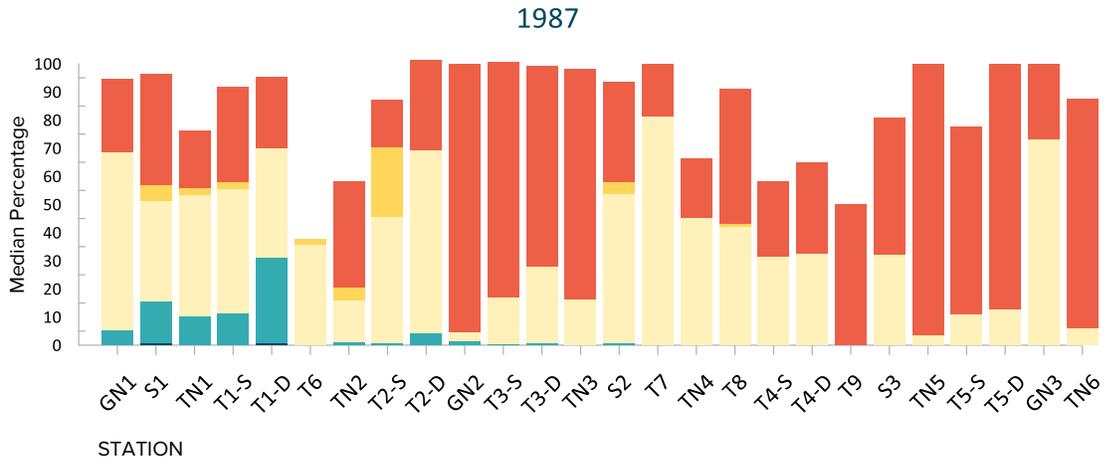


BENTHIC ORGANISMS

Evidence of water and sediment quality improvements can also be seen in District fish and benthic community composition studies. Figure 5.7 “Benthic Community Composition” shows that between 1987 and 2014 the benthic community composition has steadily changed in a positive way. Extreme opportunistic species generally associated with highly disturbed environment and abundant organic matter in the late 1980's (shown in red), gave way to more sensitive community compositions with organisms typical of balanced and less disturbed environments in 2014 (shown in blue).

Figure 5.7 BENTHIC COMMUNITY COMPOSITION

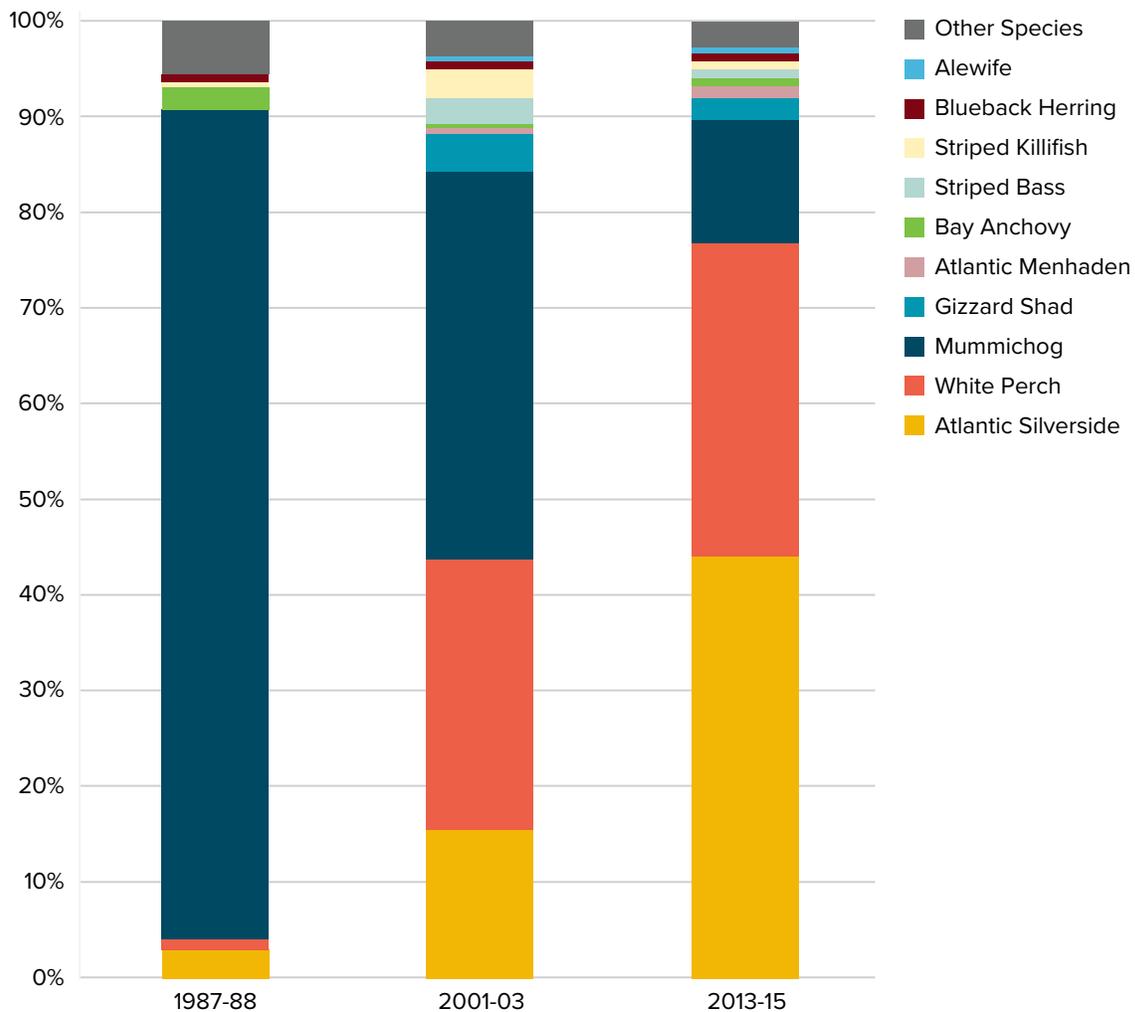
- Sensitive (present in unpolluted conditions)
- Indifferent (always present)
- Tolerant (stimulated by organic enrichment)
- Opportunists (proliferate in enriched conditions)
- Extreme opportunists (proliferate in highly enriched conditions)



SOURCE: GARY L. TAGHON, RUTGERS UNIVERSITY DEPARTMENT OF MARINE AND COASTAL SCIENCES BASED ON DATA PROVIDED BY: NJSEA AND MERI

In March 2019, the NJSEA released a study entitled “Report on Three Fishery Resource Inventories of the Lower Hackensack River within the Hackensack Meadowlands District.” Results from the NJSEA’s fish community composition study, in which fish were seasonally sampled throughout the water column in the years 1987-1988, 2001-2003, and again in 2013-2015, found that, as habitat and water quality improved, so did the number and diversity of fish. In the 1987-1988 study, mummichogs dominated the sampling effort, comprising approximately 90 percent of the catch. In 2001-2003, the river and its tributaries were found to contain a more diverse assemblage of fish, with more predators, such as striped bass and bluefish, and less opportunistic types. In the 2013-2015 study, it was observed that the fish populations were similar to those sampled in the 2001-2003 study. Figure 5.8 “Comparison of Relative Abundance of Fish Species” depicts the ten species most frequently occurring within sample collections over the three study periods.

Figure 5.8 COMPARISON OF RELATIVE ABUNDANCE OF FISH SPECIES



SOURCE: NJSEA

The true testament to the improved health of the District's environment is evidenced by the growth in avian and wildlife diversity, and particularly threatened and endangered species that use the Meadowlands for foraging and nesting. A variety of invertebrates, amphibians, reptiles, fish, birds and mammals are found in the Meadowlands. For example, annual diamondback terrapin (*Malaclemys terrapin*) surveys undertaken by NJSEA indicate that the Meadowlands support a thriving population of terrapins and provides suitable habitat for nesting. Between 2009 and 2013, the NJSEA performed a mark-recapture study of diamondback terrapins in the lower Hackensack River. Over that five-year period, a total of 1,027 terrapins were tagged, with 209 being recaptured on subsequent sampling dates.

The Meadowlands is the largest remaining brackish wetland complex in the NY/NJ Harbor Estuary. Approximately five miles west of Manhattan, the Meadowlands supports a remarkable diversity and abundance of fish and wildlife. Birds migrating along the Atlantic Flyway feed and rest throughout the Meadowlands. Given its location amidst a highly urbanized landscape, its importance as an oasis for wildlife cannot be overlooked. The Meadowlands consists of a diverse mosaic of habitats that include tidal, brackish, and freshwater emergent wetlands, forested wetland, upland deciduous forest and early successional habitats (e.g., deciduous scrub/shrub). A diversity of habitats usually results in a diversity of avian species, and the Meadowlands are no exception. In the late 1960's, a study of the birds of the Hackensack Meadowlands reported 205 species. Observations made by the HMDC/NJMC/NJSEA, Audubon Society and many other observers over the ensuing years has increased the number of bird species sighted in the Meadowlands to approximately 288 species.

A 2007 report by the NJ Audubon Society ("Avian Abundance and Distribution in the New Jersey Meadowlands District: The Importance of Habitat, Landscape, and Disturbance") noted that the District is home to many breeding species, several of which, like Pied-billed Grebe (*Podilymbus podiceps*), American Bittern (*Botaurus lentiginosus*), Yellow-crowned Night-Heron (*Nycticorax violaceus*), Black-crowned Night-Heron (*Nycticorax nycticorax*), and Northern Harrier (*Circus cyaneus*), are listed as "endangered" or "threatened" by the state of New Jersey. The District also hosts more than 150 bird species during the migration and winter seasons. Waterfowl, long-legged wading birds (i.e., herons, egrets), raptors, shorebirds, and migrant songbirds, all find refuge and respite in the Meadowlands during passage between their breeding and wintering grounds. For many species, the District is their winter home. NJSEA Natural Resources Management staff are currently researching avian high marsh breeding habitat.

The Meadowlands have also experienced a resurgence in the number of top-level predators, such as the osprey, which are, after a long absence, once again nesting in the Meadowlands, and in the large numbers of bald eagles and cormorants which make the Meadowlands their home. The diets of these three bird species consist mainly of fish, which are once again abundant in the Hackensack River and its tributaries. Another example of the resilience of nature is the peregrine falcon. Once almost driven to extinction due to the effects of organochlorine pesticides, peregrine falcons are now nesting in the Meadowlands.

A variety of mammals also make the Meadowlands their home. The species commonly found in the freshwater wetlands and at higher elevations in the intertidal zone include opossum, shrews, mice, moles, raccoon, weasel, skunk, coyote, fox, chipmunk, squirrel, muskrat, rat, cottontail, and deer. Freshwater marshes also provide the necessary habitat for amphibians and turtles, including the Atlantic Coast leopard frog; snapping and painted turtles; and many aquatic insects.

A list of declining, endangered, and threatened wildlife sighted in the District is maintained by the New Jersey Division of Fish and Wildlife, under the NJDEP’s Natural and Historic Resources Group. These species are presented in Figure 5.9 “Endangered, Threatened, and Special Concern Species in the Meadowlands District,” which is supplemented by observations provided by the Bergen County Audubon Society.

- Endangered species are those whose survival prospects in the State are in immediate danger because of a loss or degradation in habitat, overexploitation, predation, competition, disease or environmental pollution.
- Threatened species are those species that may become endangered if conditions begin to or continue to deteriorate.
- Species of special concern warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species.
- Stable applies to species that appear to be secure in NJ and not in any immediately foreseeable danger of becoming Endangered, Threatened, or Special Concern.
- Undetermined applies to species that cannot be assigned a status of Endangered, Threatened, Special Concern or Stable because not enough information exists on which to base a judgment.

Tidal brackish wetlands are the predominant habitat in the Meadowlands, but a diversity of habitat is found throughout the Meadowlands despite its urban location. Other habitats that are regularly surveyed and mapped by NJSEA include forested wetlands, freshwater tidal marshes, brackish and freshwater impoundments, upland meadows, shrubland, and wooded habitats. Plant species within these habitats are typically a mix of common native and non-native plants, but also include rare, threatened and endangered species.



CLOCKWISE (FROM TOP LEFT): SNOWY EGRET, BIRDS IN A TREE, OSPREY, TREE SWALLOW, BALD EAGLE, DIAMONDBACK TERRAPIN, MONARCH BUTTERFLY

Figure 5.9

**ENDANGERED, THREATENED AND SPECIAL CONCERN SPECIES
IN THE MEADOWLANDS DISTRICT**

PLANTS			
COMMON NAME	SCIENTIFIC NAME	STATE STATUS	
Floating marsh-pennywort	Hydrocotyle ranunculoides	E	
Wafer-Ash	Ptelea trifoliata	E	
REPTILES			
COMMON NAME	SCIENTIFIC NAME	STATE STATUS	
Diamondback Terrapin	Malaclemys terrapin terrapin	U	
BIRDS			
COMMON NAME	SCIENTIFIC NAME	BREEDING STATUS	NON-BREEDING STATUS
American kestrel	Falco sparverius	T	-
Bald eagle	Haliaeetus leucocephalus	E	T
Barn owl	Tyto alba	SC	SC
Barred owl	Strix varia	-	T
Black-crowned night heron	Nycticorax nycticorax	T	-
Black-throated blue warbler	Dendroica caerulescens	SC	S
Bobolink	Dolichonyx oryzivorus	T	-
Brown thrasher	Toxostoma rufum	SC	S
Canada warbler	Wilsonia canadensis	SC	S
Cattle egret	Bubulcus ibis	T	-
Common nighthawk	Chordeiles minor	SC	SC
Glossy ibis	Plegadis falcinellus	SC	S
Grasshopper sparrow	Ammodramus savannarum	T	SC
Gray-cheeked thrush	Catharus minimus	N/A	SC
Horned lark	Eremophila alpestris	T	SC
Least bittern	Ixobrychus exilis	SC	SC
Little blue heron	Egretta caerulea	SC	SC
Long-eared owl	Asio otus	-	E
Northern harrier	Circus cyaneus	E	SC
Osprey	Pandion haliaetus	T	-
Peregrine falcon	Falco peregrinus	E	-
Pied-billed grebe	Podilymbus podiceps	E	SC
Salt marsh sparrow	Ammodramus caudacutus	T	-
Savannah sparrow	Passerculus sandwichensis	T	-
Short-eared owl	Asio flammeus	E	SC
Snowy egret	Egretta thula	SC	S
Upland sandpiper	Bartramia longicauda	-	E
Wood thrush	Hylocichla mustelina	SC	S
Yellow-crowned night heron	Nyctanassa violacea	-	T

Notes:

E=Endangered; **T**=Threatened; **SC**=Special Concern; **S**=Stable **N/A**=not applicable; **U**=Undetermined

SOURCES: NJDEP, NATURAL HERITAGE PROGRAM, OCTOBER 2018
BERGEN COUNTY AUDUBON SOCIETY, 2019

Conservation interests in the Meadowlands are not limited only to the species listed in Figure 5.9, above. NJSEA’s forthcoming Wildlife Action Plan, based on the State of New Jersey’s 2018 Wildlife Action Plan, will identify additional species as “Focal Species of Greatest Conservation Need” within the Meadowlands. These species may benefit from efforts to restore breeding habitat within the Meadowlands. The following species are under consideration for identification as Meadowlands’ Focal Species of Greatest Conservation Need in the NJSEA’S Wildlife Action Plan currently under development:

AVIAN	
COMMON NAME	SCIENTIFIC NAME
American Bittern	Botaurus lentiginosus
American Coot	Fulica Americana
American Woodcock	Scolopax minor
Belted Kingfisher	Megaceryle alcyon
Black Skimmer	Rynchops niger
Clapper Rail	Rallus longiostris
Common Gallinule	Gallinula galeata
Dickcissle	Spiza americana
Eastern Meadowlark	Sturnella magna
Forster's Tern	Sterna forsteri
Gray Catbird	Dumetella carolinensis
Least Sandpiper	Calidris minutilla
Least Tern	Sternula antillarum
Marsh Wren	Cistothorus palustris
Prairie Warbler	Dendroica discolor
Rusty Blackbird	Euphagus carolinus
Scarlet Tanager	Piranga olivacea
Semipalmated Sandpiper	Calidris pusilla
Sora	Porzana carolina
Spotted Sandpiper	Actitis macularius
Vesper Sparrow	Poocetes gramineus
Virginia Rail	Rallus limicola
White-throated Sparrow	Zonotrichia albicollis
Wood Duck	Aix sponsa

INSECTS	
COMMON NAME	SCIENTIFIC NAME
Monarch butterfly	Danaus plexippus

HERPITILE	
COMMON NAME	SCIENTIFIC NAME
Atlantic Coast Leopard Frog	Lithobates kauffeldi
Painted Turtle	Chrysemys picta picta

MARINE FISH	
COMMON NAME	SCIENTIFIC NAME
Alewife	Alosa pseudoharengus
Alantic Sturgeon	Acipenser oxyrinchus
Blueback Herring	Alosa aestivalis
Bluefish	Pomatomus saltatrix
Mummichog	Fundulus heteroclitus
Shortnose Sturgeon	Acipenser brevirostrum
Striped Bass	Morone saxatilis
Striped Killifish	Fundulus majalis
Summer Flounder	Paralichthys dentatus
Weakfish	Cynoscion regalis
Winter Flounder	Pseudopleuronectes americanus

TERRESTRIAL MAMMALS	
COMMON NAME	SCIENTIFIC NAME
American Mink	Neovison vison

VII. SOLID WASTE MANAGEMENT

When the agency was created by an act of the legislature in 1969, the District was home to more than 50 orphaned landfills. At the time, near daily unregulated, illegal dumping at these sites scarred the region. A 1969 study by the State Department of Health (predecessor to the New Jersey Department of Environmental Protection) found that the District received 5,000 tons of waste per day, six days per week,



300 days per year, from 118 New Jersey municipalities and New York City. In addition, a 1970 study of the District by Zurn Environmental Engineers identified 51 individual locations covering 2,740 acres of the District as past and present solid waste dumping operations. The “present” category consisted of 12 sites totaling 940 acres. These areas were identified as accepting a variety of materials including demolition, commercial, industrial and residential waste. Thanks to the NJSEA and its predecessor agencies, this environmental catastrophe has undergone a remarkable environmental renaissance and today is a thriving urban eco-system that is home to hundreds of species of birds, fish and other wildlife.

One of the agency’s solid waste planning goals has been to remediate many of the larger sites in the District by bringing them up to modern-day standards. Many landfill sites became “orphan” landfills, where the owners abandoned them after operations had ceased, with no plan or funding in place to ensure environmental controls. Some orphan landfills ceased operating prior to 1972, while a few ceased operations prior to January 1, 1982, in order to avoid a State requirement that an escrow fund be established to finance landfill closure. As part of its mandate to provide for the sanitary disposal of solid waste, the then-Hackensack Meadowlands Development Commission took ownership of many of the landfills in the District and installed leachate collection systems and methane gas wells to prevent further environmental damage. The agency today maintains ownership and management of the closed 1E Landfill in Kearny and North Arlington and the Keegan Landfill in Kearny.

As part of its efforts to improve and cleanup landfills, the agency has spent approximately \$33 million to remediate the Keegan Landfill site in Kearny. Remedial measures included the construction of a leachate collection system and containment wall around the entire landfill; acquisition of adjacent land including the Kearny Marsh; and construction of two sewage pump stations to pump leachate from the landfill to the Passaic Valley Sewerage Commission. The agency is currently in the process of constructing and installing a gas collection and control system. The actions taken by the agency have helped rejuvenate the adjacent once heavily-polluted Kearny Freshwater Marsh into a thriving habitat for birds, fish and other wildlife.

In 2011, the agency completed the groundbreaking conversion of its closed 1A Landfill in Kearny into a solar farm. The project marked the first transformation of a State-owned landfill into a renewable energy array. The 3-megawatt installation includes 12,506 ground-mounted photovoltaic panels that supply power directly to the electric grid. This project set an example of how fallow, State-owned property can be repurposed into a productive use that benefits the environment and consumers.

In June 2019, a partnership between Russo Development of Carlstadt and Forsgate Industrial Partners of Teterboro took ownership of a portion of the Kingsland Redevelopment Area, which includes several

closed landfills: the Rutherford East and Rutherford West Landfills in Rutherford; the Kingsland Landfill, which spans Lyndhurst and North Arlington; and the Avon and Lyndhurst Landfills in Lyndhurst. The developers plan to construct industrial facilities on portions of the property and preserve other areas for environmental preservation.

Private solid waste facilities are also present at various locations throughout the District. Generally, they consist of solid waste transfer stations, recycling facilities, and composting facilities. State and/or Federal regulation of solid waste management facilities preempt local zoning authority, although they must be built to comply with State building and fire codes. Accordingly, new solid waste facilities and/or changes to the operations of existing solid waste facilities are required to be included in the NJSEA's Solid Waste Management Plan, as the Hackensack Meadowlands District, along with the State's 21 counties, comprises the State's 22 Solid Waste Management Districts.

Closed landfills provide vast expanses of upland areas located near environmentally-sensitive lands. As stated above, the NJSEA has creatively repurposed areas of former landfills that had, in many ways, scarred the Meadowlands environment. Old landfills are now the site of solar arrays that generate renewable energy, thereby reducing dependence on energy sources that contribute to greenhouse gas emissions. Other landfills provide upland passive open space, which provides for wildlife habitat in the District. In specific cases, closed landfills can play a critical role in the region's economic development through site development, such as proposed warehouse development and sustainable energy parks within the Kingsland Redevelopment Area.



DEKORTE PARK: BEFORE AND AFTER

VIII. WATER AND WASTEWATER TREATMENT

Safe drinking water and effective sewerage systems are essential components of public health. There are over 151,000 public water systems in the United States. The EPA classifies water systems according to the number of people they serve, the source of their water, and whether they serve the same customers year-round or on an occasional basis. All 14 municipalities in the District are served by public water systems of the same classification, Community Water System (CWS), which is a public water system that supplies water to the same population year-round. Drinking water requires treatment to remove contaminants that can cause illness. The Federal Safe Drinking Water Act (SDWA) sets standards for drinking water quality and arranges for oversight of the water providers who implement those standards. Water providers serving the District's municipalities are summarized in Figure 5.10 "Water Providers Serving District Municipalities."

Treatment of wastewater is necessary to avoid the pollution of surface waters and groundwater and to avoid wastewater contact with insects that transmit disease. Wastewater from a home, business, or other source enters a sanitary sewer, which is a system of pipes that collect the wastewater. From the sanitary sewer, the waste enters a treatment plant where it undergoes a series of processes ending in chlorine treatment before release into a water body such as a river or stream. An overview of the four wastewater treatment facilities serving District municipalities appears in Figure 5.11 “Wastewater Treatment Facilities Serving District Municipalities.”

A map of water and wastewater service areas is provided as [Map 9 – Utility Service Areas](#).

Figure 5.10 WATER PROVIDERS SERVING DISTRICT MUNICIPALITIES

PROVIDER	MUNICIPALITIES SERVED	COMMENTS
Suez Water New Jersey	Carlstadt, East Rutherford, Little Ferry, Moonachie, North Bergen, Ridgefield, Rutherford, Secaucus, South Hackensack, and Teterboro	Operates the Oradell Reservoir and the Haworth Treatment Plant.
Jersey City Municipal Utilities Authority	Jersey City	Operated by Suez Water Environmental Services, Inc. Water flows from the Boonton Reservoir to Jersey City and Lyndhurst via a 26-mile aqueduct system.
Kearny Water Department	Kearny	
Passaic Valley Water Commission	North Arlington and Lyndhurst	

Figure 5.11 WASTEWATER TREATMENT FACILITIES SERVING DISTRICT MUNICIPALITIES

FACILITY	MUNICIPALITIES SERVED	RECEIVING ENTITY	CAPACITY (MGD*)
Bergen County Utilities Authority	Ridgefield, Little Ferry, Moonachie, South Hackensack, Teterboro, Carlstadt, East Rutherford, and Rutherford	Hackensack River	109
North Bergen Municipal Utilities Authority	North Bergen	Hudson River (3 MGD) and Passaic Valley Sewerage Commission (7 MGD)	10
Passaic Valley Sewerage Commission	Kearny**, Lyndhurst, North Arlington, North Bergen, East Rutherford, and Jersey City **Kearny Municipal Utilities Authority sends to PVSC for treatment	Newark Bay	400
Secaucus Municipal Utilities Authority	Secaucus	Mill Creek	5.1

*Millions of gallons per day

IX. ENERGY

Energy is a main focus of current environmental policy concerns. A majority of energy is generated from non-renewable resources, including petroleum products, hydrocarbons, natural gas, and coal. However, both the environment and the economy benefit from the use of clean, renewable and reliable sources of energy. Renewable energy includes solar, geothermal, wind, biomass and hydropower energy sources.

Figure 5.12 “Energy Consumption by Source” summarizes consumption data by source for New Jersey and the United States in 2016, the most recent year for which the data are available. Renewable energy sources comprised only 3.9 percent of the total energy consumed in New Jersey, compared to 10.2 percent for the United States. The State met 80.2 percent of its total energy demands with fossil fuels, including coal, natural gas, and petroleum. In the United States, British thermal units (Btu), a measure of heat energy, is the most commonly used unit for comparing energy sources or fuels.

Figure 5.12 ENERGY CONSUMPTION BY SOURCE

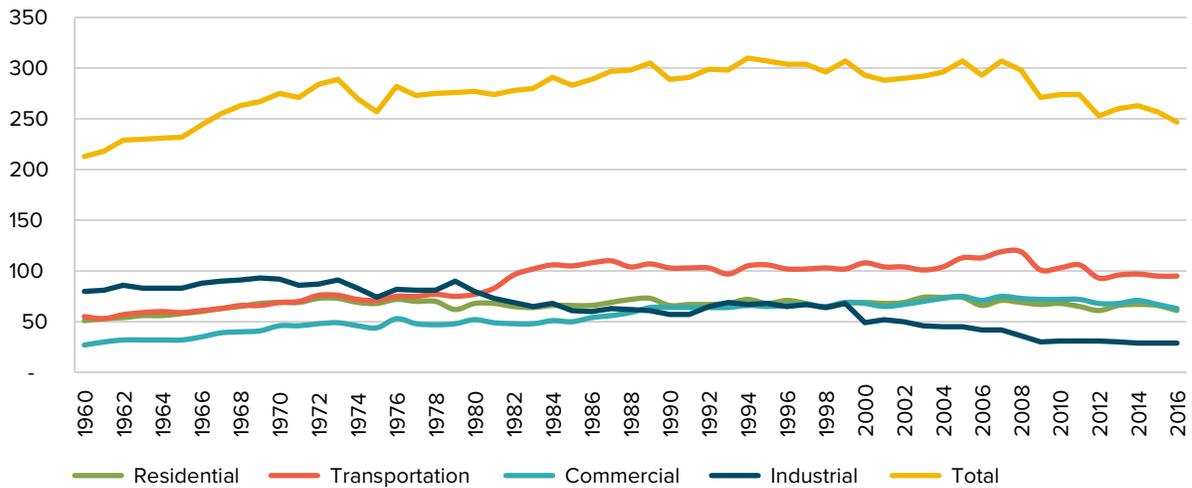
SOURCE	NEW JERSEY		UNITED STATES	
	Trillion Btu	Percent	Trillion Btu	Percent
Fossil Fuels:	1,780.1	80.2%	78,716.8	80.9%
Coal	17.5	0.8%	14,227.1	14.6%
Natural Gas	795.1	35.8%	28,438.6	29.2%
Petroleum	967.6	43.6%	36,070.2	37.1%
Nuclear Electric Power	312.6	14.1%	8,426.8	8.7%
Renewable Energy	87.3	3.9%	9,965.5	10.2%
Net Interstate Flow of Electricity/ Losses*	38.9	1.8%	-	0.0%
Net Electricity Imports	0.5	0.0%	205.6	0.2%
TOTAL ENERGY	2,219.4		97,314.7	

* A positive number indicates more electricity came in to the state than went out of the state during the year.

SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION (2016)

In 2016, while New Jersey consumed less Btu per capita in total energy than the national average (247.2 million Btu per capita in the State compared to 300.9 in the nation), ranking 38th in the nation, the State’s petroleum-dependent transportation sector consumed more energy per capita than any other sector in the State, and more than the national average (94.8 million Btu per capita in the State, compared to 86.0 in the nation). Despite New Jersey’s energy-intensive chemical manufacturing and petroleum refining industries, the State’s industrial sector consumed less energy per capita than the national average (28.6 million Btu per capita in the State compared to 97.3 in the nation). (See Figure 5.13 “Total Energy Consumption Per Capita in New Jersey by Sector (in Btus)”) Overall, the State’s total energy consumption per capita has been declining in recent years (particularly since 2007), reaching consumption levels lower than those observed in 1994 (310 million Btu per capita), but higher than those observed in 1960 (213 million Btu per capita).

Figure 5.13 TOTAL ENERGY CONSUMPTION PER CAPITA IN NEW JERSEY BY SECTOR (IN BTUS)*



SOURCE: 4WARD PLANNING, INC. / U.S. ENERGY INFORMATION ADMINISTRATION

The reliability of the energy supply and distribution network has been bolstered by several resiliency initiatives undertaken by utility providers in the District, including significant improvements in protecting and securing facilities from storms and other hazards. As part of this initiative, utility equipment located within floodplains throughout the District has been raised to withstand impacts from flooding.

The State of New Jersey’s 2019 Energy Master Plan (NJEMP) provides a strategic vision promoting sustainable energy policy within the State. In accordance with Governor Phil Murphy’s Executive Order #28 (2018), the NJEMP seeks to set New Jersey on the path to conversion to 100 percent clean energy by 2050. The new NJEMP is predicated on the following new goals:

1. Growing New Jersey’s clean energy economy;
2. Ensuring reliability and affordability for all customers;
3. Reducing the state’s carbon footprint; and
4. Advancing new technologies for all New Jersey residents.

These goals align with the sustainable energy objectives of this Master Plan. The NJSEA’s Energy Master Plan, adopted in November 2008, included a goal to bring 20,000 kilowatts (kW) of new sources of renewable energy to the District by 2020.

To date, the NJSEA has approved more than 50,000 kW of photovoltaic (solar) installations in the District, and 42,250 kW have been installed through June 2019, more than doubling the NJSEA’s Energy Master Plan goal. [Map 10 – Photovoltaic Solar Installations](#) shows the locations of solar installations in the District.

The largest photovoltaic system in the District, totaling 3,000 kW, has been installed atop the NJSEA’s 1A Landfill. In addition, the NJSEA’s administrative facilities in DeKorte Park are home to a 121-kW solar canopy above a parking area, and a 33.3-kW rooftop installation on the Center for Environmental and Scientific Education, which is the first public building in the State of New Jersey to achieve the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Platinum certification.

Furthermore, the NJSEA facilitated the formation of a solar power purchasing cooperative between the Borough of Little Ferry, the Town of Secaucus and their respective Boards of Education. This initiative



resulted in the installation of rooftop solar systems in Little Ferry totaling 76.5 kW and rooftop and ground-mounted systems in Secaucus totaling 770 kW.

The NJSEA also promotes energy efficiency and use of renewable resources throughout the District via Green Building regulations, which incentivize projects that seek to achieve LEED certification through the use of sustainable practices, via increased flexibility in zoning requirements, reduced application fees, and priority reviews.



CIRCULATION



6. CIRCULATION

An efficient, multi-modal transportation network is a vital component of the overall vision for the Hackensack Meadowlands District. The transport system network must have the capacity to meet the challenges associated with balancing several different factors, including new development and planned redevelopment, the retention and growth of commerce and jobs, and the protection of the Meadowlands environment, while facilitating the safe and efficient movement of people and goods. Further, the District's transport network must provide a safe and secure transportation system for motorized and non-motorized users and increase mobility for all including people with disabilities.

This chapter presents a review of the District's transportation system and focuses on three important elements: planning and regulatory framework, mobility, and safety. A review of the agency's transportation planning efforts and achievements since 2004 will be provided. From the mobility perspective, statistics and infrastructure analyses were performed based on different mode choices: roadway, public transit,



freight, pedestrian/cyclist, air, and maritime. From the safety perspective, roadway and transit crash data were evaluated. These approaches provide a valuable reference to pinpoint current issues and shortcomings within the District's transport network. [Chapter 7 – Systems Plan](#) will set forth a series of strategies for maintaining and improving the transportation network serving the Meadowlands District and the greater region.

I. PLANNING AND REGULATORY FRAMEWORK

Since the adoption of the 2004 NJMC Master Plan, a series of transportation planning and regulatory initiatives have been implemented in the District by this agency:

A. TRAFFIC PERFORMANCE STANDARDS

In 2004, the District Zoning Regulations were recodified to implement the objectives of the 2004 Master Plan. This recodification included specific requirements for traffic impact assessments at N.J.A.C. 19:4-7.10. These regulations require the preparation of a Traffic Impact Analysis for specified applications to allow the NJSEA to evaluate the prospective traffic impacts of individual projects on the District's transportation network and require traffic mitigation measures.

B. HACKENSACK MEADOWLANDS TRANSPORTATION PLANNING ACT

The Hackensack Meadowlands Transportation Planning Act, effective June 24, 2005, and the Hackensack Meadowlands Transportation Planning District Act of 2015 (TPD Act), effective February 5, 2015, established a Transportation Planning District (TPD) within the Hackensack Meadowlands District. The law requires the creation of a comprehensive District-wide Transportation Plan that designates transportation projects and associated funding needed to sustain future economic growth, and established the Meadowlands Transportation Planning (MTP) Board, a steering

committee overseeing the plan's development. The TPD Act empowers the NJSEA to assess fees on future District development based upon a technical analysis of its projected impact upon the transportation system, excluding costs associated with remedying pre-existing problems.

C. MEADOWLANDS DISTRICT TRANSPORTATION PLAN

The Meadowlands District Transportation Plan (MDTP) was adopted in 2007 by both the MTP Board and the NJMC. The objective of the MDTP is to identify transportation needs, recommend specific improvements, and estimate costs of improvements over a time frame that reaches to the year 2030. The MDTP fulfills the requirements of the Act and plays an important role in the MTP Board's mission to improve mobility for passengers and freight throughout the District.

The MDTP considers anticipated growth within the District and identifies the transportation improvements necessary to support such development over the ensuing twenty years. A complete range of candidate transportation improvements are recommended to address existing and future needs and provide reasonable travel conditions within the District. The estimated costs of the recommended improvements are to be partially supported by future development within the District through a fair-share formula based on a collectively supported assessment framework, accounting for credits, exemptions, and waivers where necessary. Ultimately, this will ensure that growth within the District is supported and that resources will be available to mitigate future mobility concerns. The MDTP is currently being updated.

D. DISTRICT TRANSPORTATION PLAN RULES (N.J.A.C. 19:7-1 ET SEQ.)

In 2008, the District Transportation Plan Rules were adopted by the NJMC to establish the general provisions for the assessment and collection of development fees pursuant to the Act. A Transportation Development Fee Formula was created to compute a Transportation Development Fee for each land use within a proposed development. Fees collected from proposed developments are maintained in the Meadowlands District Transportation Planning District Fund and are utilized to implement transportation improvements throughout the District and the surrounding roadway system.

II. MOBILITY

The Meadowlands District is a thriving industrial and commercial center with a dynamic residential component located in the heart of the New York/New Jersey Metropolitan region. The NY/NJ metropolitan region includes some of New Jersey's most densely populated counties (Hudson, Bergen, Essex, and Passaic counties) and their major cities (Jersey City, Newark, and Paterson). According to the 2010/2011 Regional Household Travel Survey by the New York Metropolitan Transportation Council (NYMTC), the volume of persons traveling on a daily basis in Bergen and Hudson counties totaled 6 million trips in 2010. Bergen County experienced 3,962,000 person trips on an average weekday, while Hudson County had 1,996,000 person trips.

The roadways that traverse the District are among the most heavily traveled in the nation. The travel mode choice has not changed significantly since 2000. The principal mode of transportation in the region is the automobile, accounting for nearly 67 percent of all trips, a slight decrease from 68 percent in 2000. Public transit accounts for 14 percent of trips, a slight decrease from 15 percent in 2000. The share of active modes of transportation (walking or biking) rose to 18 percent from 16 percent.

The majority of automobile and transit trips on the District's roads and railways have origins and destinations outside of the District. The District serves as a gateway to New York City through a variety

of major roadways, including the New Jersey Turnpike and Route 3. The NYMTC survey found that a total of 77 percent of the transit trips in the region are made to Manhattan, an increase from 63 percent from 2000. Bergen County accounted for 13 percent of the total work trips to Manhattan, while 31 percent of the total trips originated in Hudson County.

Bergen County residents comprise the fourth highest share of commuters using public transit in the region for work trips (after Hudson, Essex, and Union counties). Over 40 percent of public transit work trips use express bus service. The highest percentage of Bergen work trips stay within Bergen County; the second highest percentage of such work trips go into Manhattan, accounting for 13 percent of all work trips.

Hudson County residents make the most use of public transit (20 percent of all trips) and walking (30 percent) among counties in the region, and the fewest auto trips. They also make fewer trips overall than those from most other counties, partially due to fewer auto trips conveying children or other passengers to destinations.

A high proportion of person trips terminate in the county of origin. In Bergen County, 82 percent of the total trips generated within the county remained there, an increase from 79 percent in 1998. In Hudson County, 74 percent of the total trips remained within the county, an increase from 70 percent in 1998.

This section will discuss the mobility infrastructure of the following transport network modes:

- A. Roadway;
- B. Mass Transit;
- C. Goods Movement;
- D. Pedestrian/Cyclist; and
- E. Air Transportation.

A. ROADWAY NETWORK

The District and surrounding region are largely dependent on the existing roadway system for transporting people and goods. While public transit is more efficient than the automobile in terms of enabling more passengers per vehicle, greater fuel efficiency per passenger, and lower emissions per passenger, access to public transit remains limited in many parts of the region, including the Meadowlands District. The automobile's advantages to the user are perceived independence, convenience, and flexibility compared to other modes of transportation. Commuting data underscore this reliance on the automobile, as 46.2 percent of all weekday trips in the region are by single occupant vehicles (SOVs)¹. According to the NYMTC survey, data for northern New Jersey alone show that SOVs account for 58.6 percent of weekday travel modes.² While it seems that the automobile will likely continue to be the dominant mode of transportation in the District, many other evolving technologies and factors such as ride-hailing, car-sharing, and "Complete Street" initiatives advocating public safety improvements within the roadway network are changing this trend, particularly for the first and last miles.

The District's roadway network consists of five major road types: other freeways/expressways (commonly called highways), other principal arterial, minor arterial, major/minor collector, and local:

- **OTHER EXPRESSWAYS/FREEWAYS/INTERSTATE HIGHWAYS** are generally limited access roadways that function as primary arterials consisting of several lanes per direction with no parking lanes. Highways are designed to operate at higher continuous operating speed limits of 45 mph to 65 mph, are designed to provide for a high degree of mobility, and serve a regional

area. Highways that traverse the District include the New Jersey Turnpike/I-95, with major north to south access; I-495, providing east to west access to and from the Lincoln Tunnel via the New Jersey Turnpike and Route 3; and Route I-280, providing east to west access to and from both spurs of the New Jersey Turnpike, the Newark-Jersey City Turnpike, and the Holland Tunnel.

- **OTHER PRINCIPAL ARTERIALS** serve major centers of metropolitan areas and provide a high degree of mobility. Principal arterials that travel through or near the District include Route 3, a major east to west highway; Route 120, which connects Route 3 and Paterson Plank Road; Route 17, a major south to north highway providing access from Route 3 to points north; Route 46, a federal highway providing access between western counties and eastern Bergen County; and Routes 1&9/Tonnelle Avenue, a south to north route along the eastern border of the District. These highways provide major regional vehicular access to the District to and from Passaic County and Essex County (to the west), Union County (to the south), other parts of Hudson and Bergen counties, and New York City.
- **MINOR ARTERIALS** provide service for trips of moderate length, serve geographic areas that are smaller than those of principal arterials, and offer connectivity to the higher arterial system. In an urban context, they interconnect and augment the higher arterial system, provide intra-community continuity, and may carry local bus routes. In the District, minor arterials include Paterson Plank Road, West Side Avenue, County Road (CR) 503/Moonachie Road, County Avenue/Paul Amico Way (formerly New County Road), County Road, sections of Secaucus Road, Meadowland Parkway, Seaview Drive, Castle Road, CR 36/Moonachie Avenue, CR 43/Redneck Avenue, CR 506 (Belleville Turnpike/Route 7), and the Newark-Jersey City Turnpike.
- **COLLECTORS** are classified as major or minor, and provide access from local roads that connect to residential, commercial and industrial areas. Collector roads lead to arterial roadways that have a greater traffic volume capacity and provide for higher operating speed limits of 35 to 45 mph. Major collectors in the District include sections of Secaucus Road, Gotham Parkway, East Union Avenue, Industrial Avenue, Valley Brook Avenue, Polito Avenue, Murray Hill Parkway, Empire Boulevard, Commerce Boulevard, and others. Minor collectors in the District include American Way, Hartz Way, Enterprise Avenue, Park Plaza Drive, Clay Avenue, and Chubb Avenue.
- **LOCAL ROADS** provide direct access from residential, commercial and industrial areas and are generally short in distance, resulting in lower speed limits and minor traffic volumes compared to the above roadway classifications. Local roads generally provide access to either county roadways or major highways that traverse the District. Local streets in the District also include several private roads maintained by either a property owner or the corresponding municipality. These roads range from shared access roads that provide access to several businesses, to roads with through traffic access between two or more points within the corresponding town that operate as collector roadways.

Additional criteria are included in Figure 6.1 “Functional Classification of Roadways.” The roadway network within the District is presented as **Map 11 – Roadway Network.**

Figure 6.1 FUNCTIONAL CLASSIFICATION OF ROADWAYS

CRITERION	EXPRESSWAY/ FREEWAYS	PRINCIPAL ARTERIAL	MINOR ARTERIAL	MAJOR/ MINOR COLLECTOR	LOCAL STREET
Functional Role	Entirely through traffic movement with limited or no direct access to property.	Mobility is primary, access is secondary. Connects Freeways and other Arterials.	Connects Freeways, Principal Arterials and lower-classification roadways. Access is secondary.	Collects traffic destined for the Arterial network. Connects Arterials to Local Streets. Also land access.	Access is primary. Little through movement.
Roadway Continuity	Inter-city, regional and interstate.	Connects Freeways to lower-classification roadways. Connect major activity centers.	Connect Freeways and Principal Arterials to lower-classification roadways.	Continuous between Arterials. May extend across Arterials.	Discontinuous. Connect to Collectors.
Roadway Length	Usually more than 5 miles long	Usually more than 5 miles long	Usually more than 3 miles long	Varies from about 1/2 mile to 2 miles	Generally less than 1 mile long
Traffic Volumes	40,000 Vehicles per Day or more	20,000 to 60,000 VPD	5,000 to 30,000 VPD	1,000 to 15,000 VPD	100 to 5,000 VPD
Desirable Spacing	5 miles or more	2 miles or more	Generally 1/2 mile to 2 miles	Generally 1/4 mile to 1/2 mile	Varies with block length (at least 125 feet between)
Posted Speed	55 to 65 MPH	35 to 55 MPH	30 to 45 MPH	35 MPH or less	20 to 30 MPH
Access	Controlled access. Grade-separated interchanges and frontage/service roads	Intersect with Freeways, Arterials, Collectors and Local Streets. Restricted driveway access.	Intersect with Freeways, Arterials, Collectors and Local Streets. Limited driveway access.	Intersect with Arterials and Local Streets. Driveways permitted.	Intersect with Collectors and Arterials. Driveways permitted.
On-Street Parking	Prohibited	Restricted	Restricted	Normally permitted	Permitted
Community Relationship	Define neighborhood boundaries.	Define neighborhood boundaries.	Define and traverse neighborhood boundaries	Internal and traverse neighborhood boundaries.	Internal
Through Truck Routes	Yes	Yes	Permitted	Limited	Limited
Bikeways	No	Limited	Limited	Yes	Yes
Sidewalks	No	Limited	Yes	Yes	Yes

1. TRAFFIC VOLUME AND PEAK

Roadways in and around the District are among the most heavily-traveled in the nation. Traffic volume data concerning annual average daily traffic (AADT) of motorized vehicles on major roadways is provided by the New Jersey Department of Transportation (NJDOT). Figure 6.2 “Traffic Volumes of Major Roadways” provides traffic volume data for the most-heavily traveled roadway segments located in constituent municipalities of the District, both within and outside the District boundaries. The heaviest-traveled routes within the District are Route 3 and Route 495, which lead to and from the Lincoln Tunnel and New York City. Nearby routes close to the District boundaries include Interstate 80, Route 46, Route 1 (Truck), and Routes 1 & 9.

Figure 6.3 “Annual Average Daily Traffic by Municipality” indicates an average of more than 7.5 million vehicle trips occur through District municipalities per day within the 14 constituent municipalities of the District. The District’s Hudson County municipalities experience the highest levels of AADT, representing 70 percent of total traffic or 5.25 million vehicle trips.

Based on a review of traffic studies prepared by public and private transportation planning organizations, the weekday morning peak traffic period in the District starts at 6:00 AM and end at 9:00 AM, with the heaviest traffic volume occurring between 8:00 AM and 9:00 AM. The afternoon peak period starts at 3:30 PM and ends at 7:00 PM, with the greatest afternoon traffic volume occurring between 5:00 PM and 6:00 PM. The Saturday peak period begins at 11:00 AM and ends at approximately 1:30 PM.

Figure 6.2 TRAFFIC VOLUMES OF MAJOR ROADWAYS

ROADWAY	STANDARD ROUTE IDENTIFIER	MILE MARKER	COUNTY	MUNICIPALITY	AADT*	AADT NORTH/EAST	AADT SOUTH/WEST	DATA YEAR	DIRECTION
I-80	00000080	66.2	Bergen	South Hackensack	170,460	81,291	89,169	2010	East/West
Route 3	00000003	9	Hudson	Secaucus	145,832	75,083	70,749	2013	East/West
Route 495	00000495	1.09	Hudson	North Bergen	143,806	68,611	75,195	2009	East/West
Route 495	00000495	1.09	Hudson	North Bergen	143,515	68,062	75,453	2011	East/West
I-80	00000080	65.84	Bergen	Teterboro	142,365	52,721	89,644	2014	East/West
Route 3	00000003	5.97	Bergen	Rutherford	136,464	67,750	68,714	2015	East/West
Route 495	00000495	1.09	Hudson	North Bergen	135,368	62,701	72,667	2012	East/West
I-80	00000080	66.2	Bergen	South Hackensack	134,867	69,374	65,493	2015	East/West
Route 495	00000495	1.09	Hudson	North Bergen	130,595	63,116	67,479	2015	East/West
Route 3	00000003	5.97	Bergen	Rutherford	129,996	64,921	65,075	2014	East/West
I-80	00000080	66.2	Bergen	South Hackensack	127,696	67,765	59,931	2014	East/West
Route 3	00000003	6.46	Bergen	Rutherford	121,275	50,161	71,114	2013	East/West
Route 3	00000003	9.32	Hudson	Secaucus	117,914	63,879	54,035	2012	East/West
Route 3	00000003	9.32	Hudson	Secaucus	116,928	63,960	52,968	2015	East/West
Route 3	00000003	7.45	Bergen	East Rutherford	115,986	58,465	57,521	2013	East/West
Route 3	00000003	9.91	Hudson	Secaucus	115,478	58,411	57,067	2009	East/West
Route 3	00000003	9.32	Hudson	Secaucus	105,138	60,176	44,962	2009	East/West
I-80	00000080	65.84	Bergen	Teterboro	98,981	40,063	58,918	2014	East/West
Route 1 Truck	00000001T	0.93	Hudson	Kearny	95,347	45,775	49,572	2012	North/South
Route 3	00000003	9.91	Hudson	Secaucus	95,279	47,110	48,169	2012	East/West
Route 495	00000495	0.56	Hudson	North Bergen	91,024	32,172	58,852	2012	East/West
Route 3	00000003	9.91	Hudson	Secaucus	88,521	43,277	45,244	2015	East/West
Route 495	00000495	0.56	Hudson	North Bergen	87,628	31,909	55,719	2015	East/West
I-80	00000080	65.84	Bergen	Teterboro	87,228	56,447	30,781	2015	East/West
Route 3	00000003E	9.32	Hudson	Secaucus	84,583	46,443	38,140	2012	East/West
Route 3	00000003E	9.32	Hudson	Secaucus	83,932	45,055	38,877	2015	East/West
Route 495	00000495	0.56	Hudson	North Bergen	83,460	35,685	47,775	2009	East/West
Route 1 Truck	00000001T	1.43	Hudson	Kearny	77,267	36,342	40,925	2012	North/South
Routes 1 & 9	00000001	53	Hudson	Jersey City	76,999	37,626	39,373	2013	North/South
Route 1 Truck	00000001T	0.93	Hudson	Kearny	74,531	34,576	39,955	2009	North/South
Routes 1 & 9	00000001	56.92	Hudson	North Bergen	63,995	34,842	29,153	2010	North/South
Route 1 Truck	00000001T	1.43	Hudson	Kearny	62,317	30,592	31,725	2009	North/South
Routes 1 & 9	00000001	55.73	Hudson	Jersey City	59,702	30,834	28,868	2014	North/South

SOURCE: NEW JERSEY DEPARTMENT OF TRANSPORTATION (2013)

Figure 6.3 ANNUAL AVERAGE DAILY TRAFFIC BY MUNICIPALITY

MUNICIPALITY	ANNUAL AVERAGE DAILY TRAFFIC	ANNUAL AVERAGE DAILY TRAFFIC (NORTH/EAST)	ANNUAL AVERAGE DAILY TRAFFIC (SOUTH/WEST)
Kearny	1,468,250	762,226	798,265
Jersey City	1,391,728	656,295	716,088
Secaucus	1,299,589	814,759	720,251
North Bergen	1,150,163	655,609	673,764
South Hackensack	573,800	350,129	460,862
Teterboro	475,716	224,683	268,396
Rutherford	435,722	258,897	289,709
Ridgefield	220,190	151,247	147,624
East Rutherford	199,915	174,047	185,343
Little Ferry	104,968	51,884	53,084
Ridgefield Park	88,296	84,561	56,581
North Arlington	65,773	32,607	33,166
Moonachie	39,720	18,890	20,830
Carlstadt	34,776	28,239	25,749
Lyndhurst	14,368	7,531	6,837
TOTAL	7,562,974	4,271,604	4,456,549

SOURCE: NEW JERSEY DEPARTMENT OF TRANSPORTATION – TRAFFIC VOLUME COUNTS (2013)

Travel demands in the District continue to increase due to the dynamic nature of development in the region. Mobility within the District remains one of the region's biggest challenges, as detailed in the 2004 NJMC Master Plan and 2007 MDTP. The mobility issues stem from the inadequate capacity of major roadways, particularly Routes 3, 17, 46, 120, and the New Jersey Turnpike; limited roadway crossings over the Hackensack River; and insufficient interstate highway access.

However, the NJSEA has implemented significant improvements to facilitate mobility within the District's roadway network. Chief among these initiatives is the implementation of an intelligent transportation system (ITS) that has decreased delays and travel time in surrounding transportation corridors and alleviated congestion in the area.

2. MASSTR PROJECT

Following the adoption of the MDTP in 2007, the NJSEA was awarded a United States Department of Transportation (USDOT) Federal Transportation Investment Generating Economic Recovery (TIGER) II grant to improve the efficiency of signalized intersections throughout the District. Deployed in five phases from 2012 to 2017, the Meadowlands Adaptive Signal System for Traffic Reduction (MASSTR) is an ITS that integrates adaptive traffic signal control software, vehicle image detection, and wireless/fiber communication technology to improve the operating efficiency of existing roadway infrastructure. The project incorporates all of the Meadowlands region's traffic signals into a network of self-adaptive traffic signals to efficiently reduce roadway congestion, delay, travel time, fuel consumption, and airborne emissions.

Funded by approximately \$10 million from the TIGER II grant, with an approximately \$2.5 million NJSEA match utilizing TPD funds, this project installed an adaptive traffic control system on 124 traffic signals in Bergen and Hudson counties, including the municipalities of Carlstadt, East Rutherford, Jersey City, Kearny, Little Ferry, Lyndhurst, Moonachie, North Arlington, North Bergen, Teterboro, Ridgefield, Ridgefield Park, Fairview, Hasbrouck Heights,



Rutherford, Secaucus, and South Hackensack, on roadways including Route 1&9, Route 46, Route 7, Route 17, and Route 120. Currently, 124 traffic signals operate adaptively throughout the region. A map of the MASSTR system is shown on [Map 12 – MASSTR Adaptive Signal Map](#).

Expansion of the MASSTR signalized intersection network continues, including at the following locations:

- **SECAUCUS ROAD (FEDEX) - JERSEY CITY:** A new adaptive signal was installed in 2017 at the intersection of the FedEx distribution facility (1049 Secaucus Road) site driveway/W.Y. Industries site driveway and Secaucus Road in Jersey City. The new signal was incorporated into the NJSEA MASSTR system upon installation.
- **WASHINGTON AVENUE – CARLSTADT:** Two new adaptive signals were installed in 2019 at the Washington Avenue/Road A intersection and the Washington Avenue/Barell Avenue intersection in Carlstadt. These two signals will be incorporated into the NJSEA MASSTR system when construction is completed.
- **PAUL AMICO WAY AND CASTLE ROAD – SECAUCUS:** A new signal is proposed for the intersection of Paul Amico Way and Castle Road in Secaucus as part of the new Edison ParkFast facility at 650 New County Road. The new facility is intended to provide commuter parking for the Frank R. Lautenberg Station at Secaucus Junction. Construction is anticipated to start during Summer 2019 and the new signal will be incorporated into and operated by the NJSEA MASSTR system.

Continuing challenges to traffic management include increased travel demands, the deterioration of existing roadway infrastructure, and the integration of emerging technologies into legacy systems used for traffic operations, planning, and management.

B. MASS TRANSIT NETWORK

The District’s mass transit network includes passenger rail service, bus service, and park and ride facilities offering parking for commuters using either rail or bus service. NJ Transit is the major agency providing both passenger rail and bus services in and around the District. According to the American Public Transportation Association (APTA) 2019 Public Transportation Factbook, NJ Transit

is the 7th largest transit agency in the nation, carrying approximately 269 million passenger trips across all modes of transit, logging approximately 3.4 billion passenger miles in 2017.

1. PASSENGER RAIL SERVICE

The passenger rail system, both within the District and statewide, began as several competing private enterprises. NJ Transit assumed operations of commuter rail facilities in the State on January 1, 1983, after Congress ordered Consolidated Rail Corporation (Conrail) to cease its passenger operations. The passenger rail system shares tracks with freight service and Amtrak. The active passenger rail lines in and around the District include the Northeast Corridor, Morris



and Essex, Main/Bergen, Pascack Valley, and Meadowlands Rail Lines, and the Port Authority Trans-Hudson Corporation (PATH). The rail system in the District, including the passenger rail lines and stations, is shown in [Map 13 – Rail System \(Passenger and Freight\)](#).

Both NJ Transit and Amtrak, which provides nationwide passenger rail service, operate on the Northeast

Corridor (NEC) Line. The Northeast Corridor is the busiest Amtrak line in the nation, providing service between Boston and Washington, D.C. The NEC traverses the District between Newark and New York; however, Amtrak does not currently stop at the Frank R. Lautenberg Station at Secaucus Junction. However, Secaucus Junction remains among the busiest transit stations, with average weekday boarding of over 26,000 passengers in 2017.

Per NJ Transit's Quarterly Ridership Trends (July to September 2018), NJ Transit's passengers on the NEC make up approximately 38.5 percent of NJ Transit's total weekday average ridership of 320,900 daily passenger rail trips. Average weekday ridership from July to September 2018 on commuter rail lines in the region is as follows:

- Northeast Corridor: 123,450 daily passenger trips;
- Morris & Essex: 59,550 daily passenger trips;
- Main/Bergen Line: 31,050 daily passenger trips; and
- Pascack Valley Line: 8,400 daily passenger trips.

The Meadowlands Rail Line (also known as the Meadowlands Loop) was opened in July 2009. It provides rail service between the Meadowlands Sports Complex and Secaucus Junction, with some services continuing to Hoboken Terminal. The services are offered for major events at the Sports Complex. ⁱⁱⁱ The Meadowlands Loop can accommodate up to 8,000 passengers per hour.

Average PATH weekday ridership at New Jersey stations is approximately 150,000 passenger trips as of 2018. PATH set a system-wide annual ridership record with 83 million total passenger trips in 2017, which decreased slightly in 2018.

2. BUS SERVICE

Bus service is the major mode of mass transportation to employment opportunities within the District. A total of 23 public bus routes provided by NJ Transit and six private bus routes have

designated stops around or within the District. Statewide, NJ Transit operates 236 bus routes, accumulating 72.6 million annual vehicle revenue miles and serving 152 million passengers. The DeCamp Bus Company is the primary private carrier. The inter/intrastate bus routes in the District, with associated bus route numbers, are shown in [Map 14 – Bus Routes & Park and Ride Facilities](#).

NJ Transit began offering bus shuttle service from Secaucus Junction to events at MetLife Stadium and the Izod Center in 2009.

3. PARK AND RIDE FACILITIES

The District has three regional park-and-ride facilities for bus passengers and two local park-and-ride facilities for rail passengers. Another regional park-and-ride is located just outside the District near I-495 in Weehawken, en route to the Lincoln Tunnel. In-District public park-and-ride facilities include the following:

- A 1,002-space parking lot at the Vince Lombardi Service Area in Ridgefield for bus service, operated by the NJ Turnpike Authority.
- A 1,334-space parking lot in North Bergen for bus service, operated by NJ Transit and owned by the Port Authority.
- A 27-space parking lot on Green Street in Teterboro, for Pascack Valley Line rail passengers.

In addition to the park-and-ride facilities operated by public transit agencies, there are other privately-operated commercial parking facilities throughout the District, including the 1,094-space Edison ParkFast at Secaucus Junction, which opened in 2009. The opening of this lot allowed more passenger vehicle commuters to park and utilize the rail station at Secaucus Junction, and created a weekend market for “day trippers” who park and take the train to New York City.

[Map 13](#) shows the locations of the District’s rail stations and rail park-and-ride facilities. [Map 14](#) shows the locations of bus routes and associated bus park-and-ride facilities. There are also park-and-ride lots associated with four train stations located in municipalities near District boundaries, with a total parking capacity of 906 spaces, including 242 spaces at the Rutherford Station, 136 spaces at Wood-Ridge Station, 19 at Kingsland Station and 509 spaces at the Lyndhurst Station.

4. RIDE-SHARING AND RIDE-HAILING

Alternatives to private passenger vehicles are gaining in popularity, due to vehicle and fuel costs, traffic delays, and changing demographics, resulting in higher interest in such services, particularly among millennials. Trip reductions have been achieved with some measure of success through alternate work hours, telecommuting, ride-hailing, carpooling, vanpooling, as well as online shopping. More people utilize ride-hailing services to complete their trips at the first and last miles. It is predicted that these services will continuously decrease the dependence on private passenger cars, particularly in urban and suburban communities.

5. SHUTTLE SERVICE

The Meadowlands Transportation Brokerage Corporation, the first Transportation Management Association (TMA) in the state of New Jersey, that operates under the brand name “EZ Ride” (formerly known as “Meadowlink”), is a non-profit organization established in 1983 as a



public-private partnership the New Jersey Turnpike Authority (NJTA), NJSEA (as the former HMDC/NJMC), the Port Authority of New York and New Jersey (PANYNJ), NJDOT, and the Meadowlands Regional Chamber of Commerce. The main objective of EZ Ride is to reduce traffic congestion in northern New Jersey through the implementation of vehicle trip reduction measures, such as carpooling, vanpooling,

shuttle programs, transportation for older adults and people with disabilities, bike and pedestrian programs, and direct-link services to major employers in the service area. EZ Ride also assists corporations with the preparation of Transportation Demand Management (TDM) plans in an effort to analyze employees' transportation needs, and works with the public on planning projects that identify new public transit services and pedestrian access. It also uses innovative and creative public-private partnership to achieve local and regional transportation goals.

Today, EZ Ride manages New Jersey's largest carpool, vanpool and shuttle services for businesses, colleges, universities, and municipalities. EZ Ride operates a mixed fleet of minibuses, vans, and sedans that provide more than 700,000 passenger trips each year.

EZ Ride's shuttle program is funded by approximately 20 private and public partners. Its 34 minibuses transport more than 2,000 commuters on a typical workday, linking them with local train stations in Rutherford and Lyndhurst, as well as major transit hubs such as Newark Penn Station, Harrison, and Secaucus Junction. The shuttles operate 24 hours daily, seven days per week, serving workers on the night and off-hours shift.

The shuttles operate on 20 routes, five of which serve the District. The five routes are served by a fleet of 14 mini-buses and transport approximately 800 to 1,000 commuters daily, and include the following:

- The Harmon Cove Shuttle operates between Secaucus Junction and businesses located in the Harmon Cove area in Secaucus.
- The Harmon Meadow Shuttle and Harmon Meadow Express provide free shuttle services in Secaucus (funded by Hartz Mountain Industries) between Secaucus Junction and businesses in the Harmon Meadow area, as well as residents of the Harper Apartments at 100 Park Plaza Drive and Osprey Cove at 45 Meadowlands Parkway.
- The Route 3 Shuttle (funded by American Landmark Properties) links businesses located at the Meadows Office Complex in Rutherford with Secaucus Junction.
- The Rutherford-Lyndhurst Shuttle links businesses and residential communities with Kingsland Station in Lyndhurst and Rutherford Station in Rutherford.
- The Monarch Shuttle, funded by BNE Management to serve the residents at The Monarch in East Rutherford, links the residential complex with Secaucus Junction.

EZ Ride also operates vanpool and carpool services. EZ Ride currently operates 25 vanpools, servicing 200 vanpoolers, while their carpool program serves approximately 30,000 riders. In 2017, it added approximately 3,000 people to the state-wide rideshare database, which

matches commuters to a common destination, many of them recruited at more than 70 employer outreach events.

EZ Ride also offers two additional programs for those with specialized needs. The Flex-T program helps individuals with disabilities with their daily transportation needs in Bergen and Monmouth counties. “Ryde4Life” is an on-demand state-wide transportation program, started in 2017 to provide assistance to older adults who do not have smart phones to access transportation services from Lyft and Uber. The program later was expanded to serve low-income adults and provide affordable transportation for accessing jobs, medical, and social services.

6. PUBLIC TRANSIT INFRASTRUCTURE

As detailed herein, the District is home to a robust public transit network whose infrastructure is vital to the entire region. The following are noteworthy public rail infrastructure projects of significant importance to the District:

- **FRANK R. LAUTENBERG STATION AT SECAUCUS JUNCTION**

NJ Transit’s Frank R. Lautenberg Station at Secaucus Junction opened in 2004 and allowed for greater connectivity among several rail lines, thereby shortening commuter trip miles and expanding transit options. Since that time, the role of the station within the District has changed dramatically. The original concept was limited to rail transfer service between 10 of NJ Transit’s 11 rail lines. Upon the 2005 completion of NJ Turnpike Exit 15X in Secaucus, and the provision of vehicular access to the station, the intended functionality of this station was significantly altered. The first commercial



park and ride lot in the vicinity of the station was built by Edison ParkFast in 2009, which allowed additional commuters to use the station and created a weekend market for “day trippers” who park and take the train to New York City.

Construction of the Xchange residential development, located in the District’s Secaucus Transit Village Redevelopment Area near Secaucus Junction, commenced in 2006, and with a current total of 1,548 residential units, has contributed to the expansion of local rail commuter ridership at the station. Other residential developments and major employment centers in the District also provide shuttle service to Secaucus Junction.

- **PORTAL BRIDGE / GATEWAY**

Amtrak’s Portal Bridge is a swing-span railroad bridge over the Hackensack River between Kearny and Secaucus, located within the Northeast Corridor line just west of Secaucus Junction. The bridge, built in 1910, is the busiest rail span in the Western Hemisphere, carrying between 150,000 and 200,000 passengers and 450 NJ Transit and Amtrak trains per day.

Currently, rail operations on the Portal Bridge are subject to disruption due to its age, condition, and delays caused by opening the span for passage of maritime traffic. Recurring costs to maintain and repair aging and malfunctioning mechanical components are also incurred.

NJ Transit and Amtrak have completed final design and federal environmental review to replace the single, movable span of the Portal Bridge with two fixed-span bridges. Phase 1 of the project is Portal North Bridge, a two-track replacement bridge, expected to be in service in 2024. Phase 2 of the project will add the Portal South Bridge, a second, two-track high-level fixed bridge over the Hackensack River parallel to Portal North Bridge. At its completion, the project will double train capacity along this section of the Northeast Corridor, creating a total of four tracks over the Hackensack River. The project will also increase rail speeds across the span from 60 to 90 miles per hour, and provide 50-foot-high clearances to accommodate maritime operations without disruption to rail traffic.

The Portal Bridge Replacement Project will dovetail with the Hudson Tunnel Project's proposed construction of a new rail tunnel under the Hudson River. Both projects are included within the Gateway Program, a comprehensive program of strategic rail infrastructure improvements along the Northeast Corridor.

C. GOODS MOVEMENT NETWORK

The District is home to many warehouse, light industrial, and commercial businesses that serve the largest market for consumer goods in the country. Economic trends show that the greater NY/NJ metropolitan region is expected to experience continued growth in commercial and industrial development. As the economy continues to expand, so will the demand for freight movement and associated capacities of shipping ports, roadways, and railways.



Growth in different sectors of the economy, including e-commerce, has led to changes in consumer demand that impact goods movement patterns. New transportation and freight facilities, including the raising of the Bayonne Bridge roadway to accommodate larger container ships, have and will continue to affect freight delivery choices and operations.

1. FREIGHT RAIL

Northern New Jersey is served by two Class I railroads—CSX and Norfolk Southern. This freight railway system includes the Conrail Shared Assets Area, a regional railroad, the New York, Susquehanna and Western (NYS&W), extensive on- and near-dock rail operations that serve the Port, and several short line railroads. Overall, the State of New Jersey handled 46.4 million tons of rail freight in 2014.¹³

The use of freight railways ([Map 13](#)) has become more vital with the rising demand to move freight more efficiently, accompanied by increases in traffic congestion.

Intermodal facilities in the District include:

- Croxton Yard, a 179-acre facility in Jersey City and Secaucus operated by Norfolk-Southern.
- Ridgefield Heights Auto Terminal (aka Bellman's Yard), a 42-acre automotive facility in Ridgefield operated by Norfolk-Southern.
- North Bergen Yard, a facility in North Bergen operated by CSX, ten acres of which are in the District.
- South Kearny Yard, a facility in Kearny operated by CSX, 154 acres of which are located in the District.
- NYS&W Auto/Lumber Intermodal Facility, a 43-acre rail yard in North Bergen operated by NYS&W.
- NYS&W Resources Intermodal Terminal (formerly known as Land Bridge Terminal), a 24-acre private rail/truck facility located on Secaucus Road in North Bergen. This yard, operated by NYS&W, is situated along the NYS&W Railway and the parallel Conrail Northern Running Track.

Little Ferry Yard, a 53-acre rail facility located in Ridgefield, formerly operated by CSX, has closed.

These intermodal facilities have access to major highways and railways that, in turn, provide access to Port Newark-Elizabeth Marine Terminal and Newark Liberty International Airport, located a few miles south of the District. The capacities of Port Newark-Elizabeth Marine Terminal and Newark Liberty International Airport are expected to grow, increasing the need for intermodal facilities.

2. TRUCKING

Trucking moves the most freight in New Jersey and within the region, which is overseen by the North Jersey Transportation Planning Authority (NJTPA), the federally authorized Metropolitan Planning Organization (MPO) for the 13-county northern New Jersey region. According to the New Jersey Statewide Freight Plan, 74 percent of goods moved—over 365 million tons with a value of \$684 billion—were handled by trucks in 2015.² Truck terminals provide a link between trucking services and freight facilities. Positioned within the nation's largest metropolitan market area, the District offers a prime location for trucking services and associated land uses. The major truck routes in the District include Routes 1&9/Tonnelle Avenue, West Side Avenue, Route 3, Route 17, Route 46, the New Jersey Turnpike, Paterson Plank Road/Route 120, County Avenue, Belleville Turnpike, and County Road.

Mobility options for freight movement in the District and surrounding communities is anticipated to expand in the future. The NJDOT has proposed the construction of New Road, a proposed 2-mile long roadway project located in Jersey City. The New Road Project begins at the intersection of New Road and St. Pauls Avenue and extends north to the intersection of New Road and Secaucus Road. The New Road project will provide a direct connection to Croxton Yard and other intermodal and industrial areas in the vicinity, thereby reducing port-generated truck traffic on the parallel section of Route 1 & 9. This new roadway link will reduce congestion on Route 1 & 9, especially during peak hours. The proposed installation of two new adaptive signals at the St. Pauls Avenue and County Road intersections, and the modification of the two existing signals along County Road at the entrance of the Norfolk Southern railroad property, are scheduled to take place between 2020 and 2023 and will be operated under the NJSEA MASSTR system.

3. AIR CARGO

Newark Liberty International Airport (EWR) handled over 847,000 tons of air cargo in 2018, up from 826,000 tons in 2017.^{vi} In 2018, EWR's cargo led the region in growth for the fourth consecutive year, with a gain of 3.1 percent. The international sector gained 5.6 percent over 2017 levels, while the domestic sector, which constitutes nearly two-thirds of the airport's total cargo traffic, posted a 1.8 percent gain. The three leading airlines in terms of cargo volume were Federal Express, United, and UPS. In 2017, EWR was the 11th ranked air cargo airport in North America and 35th in the world.^{vii}

4. WATERWAYS AND PORTS

A system of waterways and ports also serves the District. The Hackensack River traverses the center of the District and feeds into Newark Bay where it merges with the Passaic River at the southern tip of Kearny. The Hackensack River is a navigable waterway, with the channel depth between 26 feet and 29 feet from its confluence at Newark Bay to Hackensack. Route 3, the NJ Turnpike Eastern and Western Spurs, and the Pulaski Skyway (Route 1&9) each cross the Hackensack River on fixed structure bridges. Six movable railroad bridges also cross the Hackensack River within the District, including the Portal Bridge carrying the NEC rail line. The use of the Hackensack River as a commercial waterway has lessened over time as changes in the local economy have redirected land use activity from heavy industrial uses that utilized the river for raw material and product delivery to warehouse/distribution and light industrial uses.

Northern New Jersey is home to the largest container port on the East Coast, and the second busiest port in the nation, as of April 2019. Located just south of the District, the PANYNJ Port Newark-Elizabeth Marine Terminal operates as an integrated marine terminal. The complex provides a full range of maritime commerce activities, including major container handling terminals, automobile processing and storage facilities, liquid and solid bulk terminals, breakbulk facilities, warehousing and distribution buildings, trucking firms, and an on-dock rail terminal. During 2018, the Port of New York and New Jersey handled more than 7 million TEUs (twenty-foot equivalent containers) for the first time in its history, a 6.9 percent increase over 2017.^{viii} The growth in part can be attributed to the completion of the Bayonne Bridge Navigational Clearance Project in June 2017, which raised the clearance under the bridge from 151 feet to 215 feet, allowing the world's largest container ships to pass under it and serve port terminals in New York and New Jersey. Since the project was completed, the port has seen an increase in the size of vessels calling on the port, with nearly 30 percent of all containerized cargo at the port now carried on vessels having the capacity to handle 9,000 or more TEUs – the size of vessel which formerly could not navigate under the old Bayonne Bridge.^{viii}

In addition to containerized cargo, the port handled 573,035 vehicles shipped as freight in 2018, a slight decrease of 0.7 percent from the 577,223 vehicles handled in 2017, but an increase of 12.6 percent from 2016, when the port handled 505,151 vehicles.

D. PEDESTRIAN/CYCLIST NETWORK

Walking and bicycling are healthy and economical modes of transportation that have been gaining in popularity in recent years. Recent studies show that demographic trends and cultural attitudes are shifting in ways that require a renewed focus on the needs of non-motorized transportation users. A series of 2016 studies completed by the University of Michigan's Transportation Research Institute indicated that the nationwide percentage of 16- to 44-year-olds who possess a driver's license has

been steadily declining.^{ix, x} This is consistent with studies done by the NJTPA ^{xi} and APTA ^{xii}, which characterized millennials as a multimodal generation who prefer to live in communities with a range of transportation choices. Relevant demographic and associated transportation behavioral shifts are not limited to millennials. Older adults have expressed a strong desire to age in place and benefit greatly from access to transportation systems that keep them connected without being dependent on car ownership. ^{xiii}

The pedestrian and bicycle access-ways in the District are limited in number and quality, due to the concentration of industrial and commercial land uses and existing heavily traveled roadways. According to the 2010/2011 NJTPA Regional Household Travel Survey,ⁱⁱ walking, biking, and other non-motorized modes of travel account for 7.6 percent of total trips in Bergen County and 30.7 percent in Hudson County. The higher percentage in Hudson County can be attributed to its urban nature with its greater population density, access to services, sidewalk connectivity, and accessibility to transit that reduces reliance on the automobile, particularly in Hoboken and Jersey City. The District's mode of travel shares for pedestrians or cyclists are likely to be less, given the primarily industrial and commercial nature of the District's principal land uses, and fragmented sidewalk network.

Sidewalks throughout the District vary in condition and location. District Zoning Regulations at N.J.A.C. 19:4-8.12 were instituted in 2004 to mandate that sidewalks be provided and maintained along public streets on which a property fronts. Therefore, newer developments in the District have sidewalks that are in fair condition, while older industrial and warehouse areas are inconsistent in sidewalk availability and condition. As properties are redeveloped, fragmentation of the District's sidewalk network is increasingly reduced. Additionally, the public sector has worked to improve pedestrian and cyclist safety, including a new sidewalk installation by Bergen County along Washington Avenue in Carlstadt, and a newly striped walkway and section of sidewalk by the Township of Lyndhurst, in partnership with a local developer, along Valley Brook Avenue.

The District has a number of designated bike paths, including several that were added in recent years. The bike paths in the District include the following:

- Borough of East Rutherford: a striped bike path runs along both sides of East Union Avenue east of Dubois Street and along both sides of Murray Hill Parkway between East Union Avenue and Paterson Plank Road.
- Town of Secaucus: a designated protected bike path was constructed in 2017 and runs along Meadowland Parkway, between Hudson Regional Hospital and the former home of WWOR TV 9. This bike path, as part of the Secaucus Greenway, is also connected to a walking path that continues to the south along Meadowland Parkway, circles around Hudson Regional Hospital and connects to the residential community at Harmon Cove.
- Lyndhurst Township: a striped bike and pedestrian path, known as Meadows Path, runs along Valley Brook Avenue and Chubb Avenue, improving connectivity and accessibility to NJ Transit bus and EZ Ride shuttle routes in this area. Future plans will extend the bike/pedestrian path along Valley Brook Avenue to the south and connect to the walking trails at Richard W. DeKorte Park.

In general, walkways in the District do not restrict bicycle access. However, interstate highways and several state highways, such as the NJ Turnpike and Route 3, prohibit bicycle access due for safety reasons. There is no bicycle/pedestrian connection available for crossing the Hackensack

River within the District. However, a portion of the planned East Coast Greenway (ECG), which is supported by the NJDOT, is proposed within the District. Specifically, the ECG Essex-Hudson Greenway Connector is a planned off-road shared use path between Newark and Jersey City along the Boonton rail line in Kearny, Secaucus, and Jersey City, which would offer pedestrian and bicycling options across the Hackensack River.

Trails and walkways in the District are discussed in more detail in [Chapter 3 – Land Use](#).

E. AIR TRANSPORTATION NETWORK

Newark Liberty International Airport (EWR) and Teterboro Airport are owned and operated by the PANYNJ and are the main providers of air transportation in and near the District.

EWR is a 2,027-acre facility, located approximately three miles south of the District boundary, providing national and international passenger and freight air transportation. EWR served a total of 46,065,175 passengers in 2018, an all-time record. Freight airlines transported 847,935 tons of cargo and 56,738 tons of mail in 2018.^{xiv}

Major roadway access to EWR from District roadways is provided by the NJ Turnpike and Routes 1&9. Alternative access to EWR is provided by AirTrain Newark, the on-premise monorail that connects to the Northeast Corridor rail line in Elizabeth. Passengers may connect to Amtrak and NJ Transit trains to New York City, Philadelphia, and beyond, with connections available through Secaucus Junction or Newark Penn Station, which provides access to PATH trains. In 2018, more than 12 million riders paid to connect to the airport via the Northeast Corridor Rail Link station.^{xiv}

Teterboro Airport is an 827-acre facility located in the northwest section of the District. Services include charter flights, aircraft leasing, cargo/shipping, and medically-oriented flight activities. Scheduled commercial operations are not permitted. It is also designated as a reliever airport for general aviation for the New York-New Jersey region. Teterboro Airport recorded 172,100 airline movements in 2018.

Teterboro Airport can be accessed via NJ Transit's Pascack Valley Rail Line at Teterboro Station on Green Street in Teterboro. Despite the infrequency of rail service on the Pascack Valley Rail Line, which is mostly limited to peak hours, public access to this airport is a relatively minor issue since Teterboro does not provide commercial flights.

III. SAFETY

Transportation safety is an important part of the transportation system. One of the NJSEA's goals is to improve overall system safety and reduce serious injuries and fatalities for all travelers on all modes.

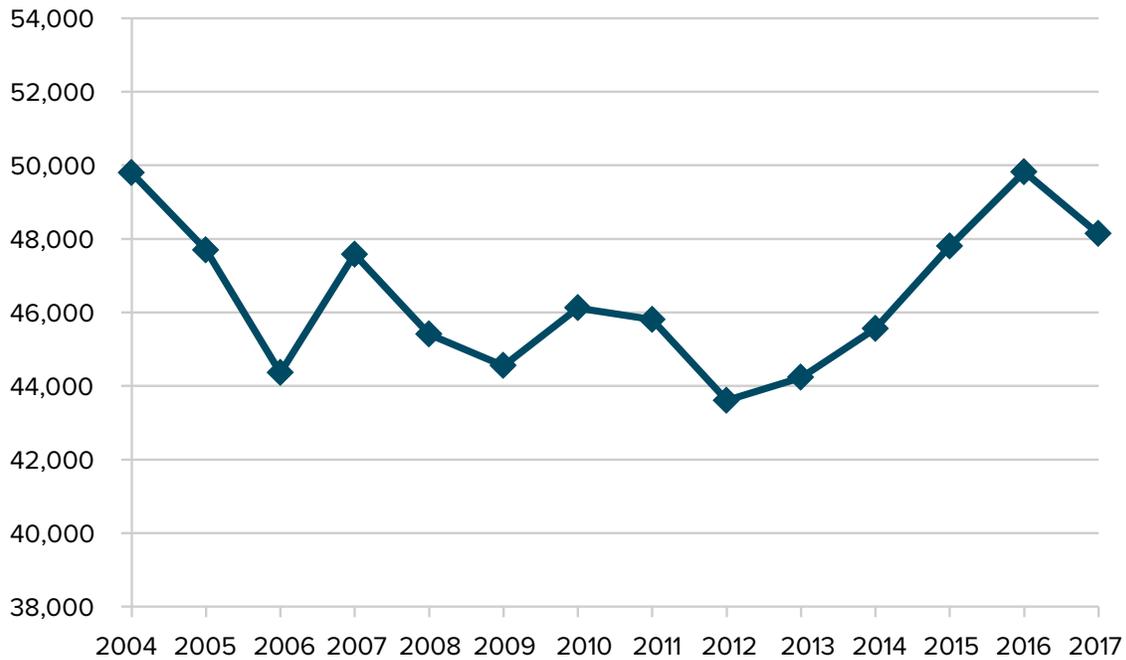
A. ROADWAY SAFETY

Certain roadways within and/or leading to the District experience higher traffic volumes, as well as a correspondingly greater share of traffic related vehicular crashes. Contrary to popular belief, per NJDOT findings, crashes often occur during clear weather, on dry surfaces, and during daylight hours. Police records show that reckless driving, poor roadway design, and vehicle malfunction are among contributing factors. The concentration of crashes at certain locations suggests the need for further investigation with respect to roadway and intersection configuration and design.

1. BERGEN AND HUDSON COUNTIES ROADWAY CRASH DATA

Figure 6.4 “Total Crashes – Bergen and Hudson Counties Combined (2004-2017)” illustrates the trends evidenced by crash statistics, including property damage, injuries, and fatalities, in Bergen and Hudson counties between 2004 and 2017. Approximately 48,000 motor vehicle crashes occurred in Bergen and Hudson counties in 2017, with 48 resulting in fatalities. The District experienced a general trend of decline in crashes from 2004 to about 2013. However, that trend came to an end in 2013-2014 when crashes started to slowly rise at 3 to 4 percent per year. This increase was likely fueled by the improving economy, which prompted increases in vehicle miles traveled, not only in the region, but also across the State and nation. Crashes nationwide jumped 3.8 percent in 2015.^{xx} Despite this troubling uptick, fatality-related crashes in the region have declined in recent years, falling from 64 fatalities in 2004 to 48 fatalities in 2017, a 25 percent reduction.

Figure 6.4 TOTAL CRASHES – BERGEN AND HUDSON COUNTIES COMBINED (2004 – 2017)



SOURCE: NJDOT CRASH DATA

2. STATEWIDE ROADWAY CRASH DATA

Figure 6.5 illustrates the trends of crashes for several major state highways containing signalized intersections within the area of the Meadowlands District. The highways selected in the analysis are Routes 1&9, Route 17, Route 46, and Route 120, major signalized state roadways in the District.

In general, the trend shows a small decline in total crashes from 2004 to 2017, with a pronounced dip around 2009, likely caused by the economic downturn at the time. Fatality-related crashes on these four highways show a general declining trend throughout the years (with the exception of 2014), from nine fatalities in 2004 to four fatalities in 2017, a 56 percent reduction.

Figure 6.5 TOTAL CRASHES MAJOR STATE HIGHWAYS (2004 2017)



SOURCE: NJDOT CRASH DATA

3. DISTRICT MUNICIPALITY ROADWAY CRASH DATA

Figure 6.6 “Total Crashes in District Municipalities (2010 2017)” shows the number of crashes that occurred between 2010 and 2017 in each municipality within the District. The data is excerpted from the NJDOT Safety Voyager, which is a tool accessible to federal, state and local government agencies to facilitate the examination of crashes. As depicted in Figure 6.6, the number of crashes for some years in some municipalities show a drastic decrease compared to other years for that municipality. These years are highlighted and considered as outliers. This inconsistency may result from crashes that are not reported, compiled, or recorded properly.

Figure 6.6 TOTAL CRASHES IN DISTRICT MUNICIPALITIES (2010-2017)

MUNICIPALITY	CRASH YEAR								TOTAL	% OF CRASHES*
	2010	2011	2012	2013	2014	2015	2016	2017		
Carlstadt	438	532	408	463	451	363	435	449	3539	2%
East Rutherford	874	950	863	708	543	643	751	695	6027	4%
Little Ferry	440	449	408	384	3	32	168	309	2193	2%
Lyndhurst	733	588	635	632	604	492	519	544	4747	3%
Moonachie	129	125	109	100	144	124	108	1	840	1%
North Arlington	345	364	344	323	366	253	335	287	2617	2%
Ridgefield	690	662	721	771	806	843	846	791	6130	4%
Rutherford	878	930	882	898	754	719	726	763	6550	5%
South Hackensack	152	173	149	151	169	190	173	184	1341	1%
Teterboro	130	140	129	122	136	155	198	45	1055	1%
Jersey City	7584	7540	7387	7909	8105	7962	8724	8043	63254	44%
Kearny	1600	1784	1698	1633	1814	1870	1815	1828	14042	10%
North Bergen	2805	2817	2833	2194	2087	2455	2921	2582	20694	14%
Secaucus	1377	1467	1343	1238	1338	1476	1258	1273	10770	7%

* Percentage of all crashes in District municipalities

 Outlier

SOURCE: NJDOT SAFETY VOYAGER, JUNE 2019

Map 15 – NJDOT Crash Data (2015 to 2017) shows the thematic map of high crash rate locations for four major signalized corridors in the District: Route 1&9, Route 17, Route 46 and Route 120. The crash rates shown are the average value of three years’ worth of data from 2015 to 2017, and are also depicted in Figure 6.7 “In-District High Crash Rate Locations.” The crash rate is calculated as:

$$R = \frac{C \times 1,000,000}{V \times 365 \times N \times L}$$

Where,

R = Roadway crash rate for the road segment expressed as crashes per 1 million vehicle-miles of travel

C = Total number of roadway crashes in the 3-year study period

V = Traffic volumes using Average Annual Daily Traffic (AADT) volumes

N = Number of years of data (3 years)

L = Length of the roadway segment in miles

Figure 6.7 IN DISTRICT HIGH CRASH RATE LOCATIONS (2015-2017)

ROUTE NO.	MILEPOST	TOTAL CRASHES	CRASH RATE
1&9	54.00	176	200.15
	54.61	198	18.80
	59.91	89	11.56
	61.32	27	12.81
	61.79	37	8.98
17	8.27	57	7.11
46	68.51	10	5.41
	70.41	17	9.83
	71.30	2	7.57
120	0.19	6	5.54

CRASHES

- 0-15
- 15-60
- 60+

SOURCE: NJDOT CRASH DATA

The crash rate trend in the District since the adoption of the 2004 NJMC Master Plan reflects a decline between 2004 and 2012, followed by an increase after 2012. The declines were likely caused by the economic downturn within that time period, when exposure to crashes were lower because of fewer vehicles on the roadways.

Statewide crash data indicates that approximately 33 percent of fatal and serious injury crashes occurred on state highways and 57 percent on local roads. The analysis also identified three high-priority crash types (lane departure, at intersections, and pedestrians/bicyclists) and two high-priority, behavior-related crash types (drowsy/distracted driving and aggressive driving). ^{xvi} A review of the crash data within the area of Meadowlands District indicated that the crash types follow similar patterns as the Statewide crashes. ^{xvii}

B. TRANSIT SAFETY

The Federal Transit Administration (FTA) maintains a National Transit Database (NTD) that keeps track of the industry information and statistics of transit systems nationwide. Figure 6.8 “Safety Data for the Northern New Jersey Region (Year 2016-2018)” shows the transit crash data for different modes of public transit in the Northern New Jersey region and the trend over the most recent three years from 2016 to 2018. ^{xviii}

Figure 6.8

SAFETY DATA FOR THE NORTHERN NEW JERSEY REGION (2016-2018)

MODE	2016			2017			2018		
	COLLISIONS	FATALITIES	INJURIES	COLLISIONS	FATALITIES	INJURIES	COLLISIONS	FATALITIES	INJURIES
CB	16	1	19	18	3	49	10	1	10
DR	37	0	42	22	0	31	21	0	31
DT	0	0	0	0	0	0	0	0	0
FB	9	0	12	1	0	1	3	0	3
LR	25	0	30	35	1	36	29	1	25
MB	322	5	591	322	3	487	289	4	460
VP	0	0	0	0	0	0	0	0	0
YR	7	1	12	10	1	7	6	0	6
TOTAL	416	7	706	408	8	611	358	6	535

MODE CODES

- **CB** = Commuter Bus
- **DR** = Demand Response - Paratransit
- **DT** = Demand Response - Taxi
- **FB** = Ferry Boat
- **LR** = Light Rail
- **MB** = Motor Bus
- **VP** = Vanpool
- **YR** = Hybrid Rail

SOURCE: FEDERAL TRANSIT ADMINISTRATION NATIONAL TRANSIT DATABASE

IV. CONCLUSIONS

Although the region has an extensive and enhanced transportation system, the District faces many persistent transportation challenges. The District's transportation network requires greater interconnectivity and capacity to meet current and future demands. [Chapter 7 – Systems Plan](#) will review methodologies to improve and upgrade the transportation system across all modes in the District. The findings with respect to transportation in the District can be summarized as follows:

- Since 2013, the regional economy has rebounded, regaining jobs lost during the recession of 2007-2009. Lower gasoline prices, an improved economy, and other factors are anticipated to result in increased travel demands on our transportation network.
- The roadways that traverse the District are among the most heavily traveled in the nation. The travel mode choice has not changed greatly from 10 years ago, as the automobile is still the principal mode of transportation in the region. The District is expected to face the continuing challenge of severe road congestion and unreliable travel times in many locations.
- Use of public mass transit, including passenger rail and bus service, is low in view of the high degree of urbanization and the overall population density in the region. The lack of transit availability within the District employment centers is a factor that limits its use. Many mass transit facilities are in great need of repair or replacement, including the Portal Bridge, and the North

River Tunnel, which runs under the Hudson River between Weehawken, New Jersey, and Penn Station, New York City. The current bus and rail transit network in northern New Jersey is nearing its capacity, and yet certain areas within the District have limited to no bus or rail services. The rise of ride-hailing services such as Uber and Lyft, and the looming changes expected as a result of autonomous vehicles, may change the dynamics of mode share. These emerging trends have the potential to either augment transit or cut into its market share.

- Facilities for pedestrians and bicyclists are limited. More emphasis on “Complete Streets,” a USDOT initiative, is needed in the future to add more facilities for safe walking and biking.
- Missing connections and operational deficiencies contribute to traffic delays. The transportation system includes various routes for travel between New York City and the suburban areas of New Jersey and New York State. However, the system is not fully responsive to intra-District travel, particularly given the presence of significant employment centers in the District or the major sports and exposition venue and future American Dream Meadowlands entertainment and retail facility at the Meadowlands Sports Complex.
- Newark Liberty International and Teterboro Airports have limited land available for growth and expansion. Vehicular access delays to these facilities during peak travel times are caused by high traffic volumes on major roadways.
- As economic growth continues so will the already high demand for freight movement and associated capacities of shipping ports, roadways and railways. Positioned within the nation’s largest metropolitan market area, the Meadowlands District offers a prime location for intermodal services and related land uses. The use of freight railways has become more vital with the rising demand to move freight more efficiently; however, truck access needs to be improved.

FOOTNOTES

ⁱ 2010/2011 Regional Household Travel Survey – Final Report (2014) – New York Metropolitan Transportation Council & North Jersey Transportation Planning Authority – pp.152, Table 4-51: Bergen-Passaic 68.5%, Essex-Hudson-Union 68.3%, multiply 67% auto trips – pp.102.

ⁱⁱ 2010/2011 Regional Household Travel Survey – Final Report (2014) – New York Metropolitan Transportation Council & North Jersey Transportation Planning Authority – pp.153, Table 4-52.

ⁱⁱⁱ Meadowlands Rail Service. Retrieved from: https://www.njtransit.com/sf/sf_servlet.srv?hdnPageAction=MeadowlandsTo

^{iv} Association of American Railroads.

^v New Jersey Statewide Freight Plan, December 2017.

^{vi} The Port Authority of NY & NJ December 2018 Traffic Report, EWR.

^{vii} Airports Council International.

^{viii} Port Authority of New York and New Jersey, Press Release 15-2019, January 31, 2019. (https://www.panynj.gov/press-room/press-item.cfm?headline_id=3066)

^{ix} Sivak, M., & Schoettle, B. (2016). Recent Decreases in the Proportion of Persons with a Driver's License across All Age Groups. Ann Arbor: The University of Michigan Transportation Research Institute. Retrieved from: http://www.umich.edu/~umtriswt/PDF/UMTRI-2016-4_Abstract_English.pdf

^x New Jersey Bicycle & Pedestrian Master Plan (2016). <https://www.state.nj.us/transportation/commuter/bike/pdf/bikepedmasterplan2016.pdf>

^{xi} NJTPA Plan 2045 – Executive Summary. Retrieved from: [https://www.njtpa.org/getattachment/Planning/Plan-2045-\(1\)/njtpa_ExecSummPrint_webfinal2.pdf.aspx](https://www.njtpa.org/getattachment/Planning/Plan-2045-(1)/njtpa_ExecSummPrint_webfinal2.pdf.aspx). pp 5.

^{xii} American Public Transportation Association (2014), Millennials & Mobility: Understanding the Millennial Mindset. Retrieved from: <https://www.apta.com/resources/reportsandpublications/Documents/APTA-Millennials-and-Mobility.pdf>

^{xiii} Farber, N., Shinkle, D., Lynott, J., Fox-Grage, W., & Harrel, R. (2011) Aging in Place: A State Survey of Livability Policies and Practices. National Conference of State Legislatures and the AARP Public Policy Institute. Retrieved from <http://assets.aarp.org/rgcenter/ppi/liv-com/aging-in-place-2011-full.pdf>

^{xiv} 2018 Air Traffic Report, Port Authority of NY & NJ.

^{xv} NJTPA: Safety Planning at the NJTPA, retrieved from: <https://www.njtpa.org/planning/regional-studies/safety>

^{xvi} New Jersey Strategic Highway Safety Plan (2015). Retrieved from: <https://www.njtpa.org/getattachment/Planning/Regional-Studies/Completed-Studies/New-Jersey-Comprehensive-Strategic-Highway-Safety/New-Jersey-Strategic-Highway-Safety-Plan/2015strategichighwaysafetyplan.pdf.aspx>

^{xvii} New Jersey Strategic Highway Safety Plan (2015). pp 3-1. Retrieved from: <https://www.njtpa.org/getattachment/Planning/Regional-Studies/Completed-Studies/New-Jersey-Comprehensive-Strategic-Highway-Safety/New-Jersey-Strategic-Highway-Safety-Plan/2015strategichighwaysafetyplan.pdf.aspx>

^{xviii} Federal Transit Administration National Transit Database, Safety & Security Time Series Data. Retrieved from: <https://www.transit.dot.gov/ntd/data-product/safety-security-time-series-data>

SYSTEMS PLAN

7

7. SYSTEMS PLAN

The 2004 Master Plan recognized the intricate interrelationship of several fundamental systems that affect the Meadowlands District as a whole. In this Master Plan Update, the Area Plans ([Chapter 8](#)) provide a plan based on the physical character of specific locations within the District, while the Systems Plan addresses the following categories broadly affecting the overall District:

1. Natural Environment
2. Economic Development
3. Transportation
4. Housing
5. Community Facilities
6. Historic Resources

Together, the Systems and Area Plans comprise the core of this Master Plan and provide the strategies to guide the realization of the overall vision for the Meadowlands District.

In developing this Master Plan, it became apparent that the majority of the strategies of the 2004 Master Plan have been effective as implementation of the plan has progressed, as described within the previous chapters of this Master Plan. Accordingly, there are no significant changes to the overall vision for the Systems Plan, which is to preserve the natural resources of the Meadowlands while promoting economic prosperity. Notwithstanding these successes, the plan's objectives must be updated and expanded to reflect current and anticipated conditions. This Master Plan will also provide recommendations for additional studies to be completed to ensure that these objectives remain relevant via Strategic Action Plans following each System Plan. The Strategic Action Plan for each system will provide the strategies proposed to implement the objectives of this Master Plan over the next decade.

SYSTEM 1: NATURAL ENVIRONMENT

The NJSEA seeks to safeguard the natural resources of the Hackensack Meadowlands District and to provide quality public recreational and educational opportunities, via the following objectives:

1. Preserve and protect existing natural areas, habitats, and other open space.
2. Manage and restore the wetlands, waterways, and other natural resources of the Meadowlands District.
3. Encourage emission reductions of pollutants from mobile and stationary sources to improve the NY/NJ metropolitan area's air quality.
4. Promote environmental education and awareness in the metropolitan area.



OBJECTIVE 1: PRESERVE AND PROTECT EXISTING NATURAL AREAS, HABITATS, AND OTHER OPEN SPACE.

- Target and prioritize wetlands and other natural habitats for acquisition, deed restriction, and conservation easements.
- Continue to implement the NJSEA Wetlands Program Plan and prepare regular updates to document the evolving nature of the Meadowlands’ natural habitats.
- Maintain the value of the Meadowlands as an urban sanctuary for birds and other wildlife by ensuring the proper management and protection of wildlife habitats in the District, and seeking available funding for land acquisition, protection, and management of wildlife preserves.
- Improve connections among the District’s habitats and trails, thereby reducing fragmentation.
- Improve active and passive recreation opportunities, with access available equally to all citizens of the District and surrounding communities.
- Continue collaboration with other agencies and environmental stakeholders in the endeavor to protect the ecology of the Hackensack Meadowlands and the State as a whole.
- Maintain an active role in policy discussion and formulation affecting natural areas in the District.

OBJECTIVE 2: MANAGE AND RESTORE THE WETLANDS, WATERWAYS, AND OTHER NATURAL RESOURCES OF THE MEADOWLANDS DISTRICT.

- Preserve, restore, and maintain the ecology of the Meadowlands, including the waterways, shorelines, wetlands and uplands, to maintain and expand the natural capital of the Meadowlands and to maximize the benefits that the surrounding communities receive from these natural resources.
- Target and prioritize restoration sites, with a goal of increasing their natural capital, defined as the renewable and non-renewable resources (plants, animals, water, soil, etc.) that combine to yield a flow of benefits to people.
- Manage natural and open space areas to increase biodiversity and remove invasive species that create species monocultures.
- Re-establish hydrologic flows by removing barriers and impediments that negatively impact hydrologic functions. Ecosystem services that would be improved by these actions include improved water quality, flood water retention and habitat enhancement.
- Create interconnected networks of open spaces along the river network by creating and connecting greenways.
- Develop nature-based flood control strategies and pursue funding to undertake these innovative approaches.
- Facilitate communication and coordination among multi-jurisdictional environmental mitigation endeavors within the District, such as resiliency strategies, flood control projects, and remediation of contaminated sites, to ensure project goals are achieved in a complementary manner to preclude unanticipated or deleterious consequences.
- Minimize the amount of impervious surfaces that contribute to flooding.
- Control water pollution from point and non-point sources through the use of innovative technologies including green infrastructure, best management practices, and constructed wetlands.



- Where possible, assist municipalities and wastewater treatment plants with developing long-term control plans to separate combined sewer systems.
- Continue to coordinate with the Meadowlands Environmental Research Institute on environmental monitoring and research on the Meadowlands environment, including analyzing data to determine trends, document improvements, and assess the need for additional or more stringent measures to protect the environment.
- Promote cost-effective resource management and pursue diverse funding sources.

OBJECTIVE 3: ENCOURAGE EMISSION REDUCTIONS OF POLLUTANTS FROM MOBILE AND STATIONARY SOURCES TO IMPROVE THE NY/NJ METROPOLITAN AREA'S AIR QUALITY.

- Monitor regional air quality to determine trends and the need for additional or more stringent actions.
- Perform traffic analyses to determine trends and recommend additional actions.
- Permit types of land development in patterns that will influence the choices of travel modes available through zoning, planning for areas in need of redevelopment, and design guidelines.
- Implement smart growth transportation initiatives to enhance the viability of future projects.
- Consider other strategies for the District including transit-oriented development, infill development, brownfield redevelopment, mixed-use development, shared parking, and promoting employer incentives for employee transit use.
- Facilitate and promote alternatives to automobile travel, such as mass transit, bicycling, and walkable communities in cooperation with local, State and Federal governments, public interest groups, and the private sector.
- Promote the use of clean and renewable energy sources.

OBJECTIVE 4: PROMOTE ENVIRONMENTAL EDUCATION AND AWARENESS IN THE METROPOLITAN AREA.

- Promote programs of the Meadowlands Environment Center for school children and the general public. The NJSEA will continue to work with its partner in this endeavor, Ramapo College, to build on its past successes in environmental education and awareness.
- Continue to work with MERI – Rutgers University to undertake innovative research that further protects and restores the District's natural resources, producing credible and salient science and information that increases the biodiversity and adaptive capacity of the District's natural resources.
- Continue to work with local stakeholder groups such as the Meadowlands Conservation Trust, Bergen County Audubon Society, Hackensack Riverkeeper, and NY/NJ Baykeeper, to encourage public environmental stewardship and increased use of citizen science.
- Update media resources to easily provide information to school groups and the general public, including lesson plans available for downloading from the NJSEA website for educators' use in the classroom; information on Meadowlands citizen science resources; and links to the Meadowlands nature blog and other local resources.
- Position the NJSEA as a clearinghouse for Meadowlands-related information, including information developed through NJSEA's research efforts, such as baseline data, findings, and reports available to the general public via the NJSEA website and the MERI library.
- Share long-term monitoring results pertaining to the natural resources to demonstrate environmental impacts and trends in the District.

➔ **STRATEGIC ACTION PLAN – NATURAL ENVIRONMENT SYSTEM**

1. Update the NJSEA Wetlands Program Plan for the time period from 2019 to 2023 to provide a framework for analyzing, assessing, preserving and protecting the wetlands and open water in the District.
2. Prepare a new District Wildlife Management Plan to effectively protect and manage Meadowlands habitats.
3. Prepare a Natural Resources Strategic Plan to provide specific strategies to accomplish natural resources goals in the District.
4. Provide the District’s monitoring data to the New Jersey Tidal Wetland Monitoring Network to coordinate the development of a statewide network of wetland condition assessments.
5. Update the District Green Map to identify and promote active and passive recreational opportunities in the District, including revitalizing Meadows Path and enhancing the Hackensack River Greenway through the District.
6. Investigate and devise various methods to promote wetlands acquisition and to seek funding for maintenance and restoration of wetland sites in the District.
7. Study air quality and conduct monitoring to identify and address air quality impacts in the District.
8. Review NJSEA zoning regulations to ensure that current environmental performance standards are utilized and investigate other opportunities for potential amendments to address the goals of the Natural Systems Plan.

SYSTEM 2: ECONOMIC DEVELOPMENT

The NJSEA will foster a vibrant economy for the District while enhancing the environment of the Meadowlands and promoting the well-being of its constituent municipalities. Emphasis will be placed upon redevelopment and infill development and avoiding impacts to environmentally sensitive lands.

The objectives for the Economic Development System Plan are as follows:

1. Cultivate a sense of place unique to the District.
2. Promote the redevelopment of properties in the District.
3. Strengthen partnerships to support the District’s economic base.
4. Promote the use of innovative technology in buildings and business operations.
5. Continue to make the development review process more efficient and effective.
6. Promote stakeholder involvement in protecting District properties from losses due to natural and other hazards.
7. Ensure that economic development occurs in sync with other Systems.

OBJECTIVE 1: CULTIVATE A SENSE OF PLACE UNIQUE TO THE DISTRICT.

- Promote greater place recognition of the Meadowlands District as a desirable location to work, play, and live.
- Establish clearly defined boundaries, including the use of coordinated signage at exit points from primary roadways,



to publicize the presence of the District and direct visitors to various area attractions in an effort reinforce the value of the District's unique natural and cultural resources.

- Promote the continued maintenance and enhancement of the District's public areas, including well-planned streetscapes, parks, other landscaped areas, and aesthetically-pleasing building and site design.
- Continue, along with the NJSEA's educational partner, Ramapo College, the mission to educate the public, and particularly school children, about the importance of the Meadowlands.
- Continue to partner with environmental stakeholders to showcase the natural resources of the District by sponsoring special events and activities in public areas, such as Butterfly Day and the World Series of Birding, and promoting eco-tourism through activities such as boat tours and nature walks.
- Improve connectivity among commercial, educational, and cultural facilities and activities, including the Meadowlands Sports Complex, and improve accommodation of pedestrians, bicyclists, and transit users.

OBJECTIVE 2: PROMOTE THE REDEVELOPMENT OF PROPERTIES IN THE DISTRICT.

- Promote the redevelopment of substandard sites in the District to improve the tax base, attract businesses, create jobs, preserve open space, and prevent sprawl.
- Promote the cleanup of contaminated sites in the District.
- Incentivize development by utilizing the regulatory process, where applicable, to upgrade properties meeting the criteria to be deemed in need of redevelopment.
- Implement redevelopment plans in accordance with the uses designated for the Planning Area in which the site is located pursuant to the District Land Use Plan.
- Assist redevelopers by coordinating technical assistance and identifying financial incentives potentially available from State and federal agencies and other entities.

OBJECTIVE 3: STRENGTHEN PARTNERSHIPS TO SUPPORT THE DISTRICT'S ECONOMIC BASE.

- Continue partnerships with the Meadowlands Regional Chamber (MRC) and other representatives of the business community to market the many benefits of conducting business in the Meadowlands District.
- Maintain the NJSEA website as a central promotional tool, including links to the governments of Bergen and Hudson counties; Meadowlands municipalities; the MRC; and State, Federal, and private non-profit entities offering economic assistance programs, including the New Jersey Economic Development Authority.



OBJECTIVE 4: PROMOTE THE USE OF INNOVATIVE TECHNOLOGY IN BUILDINGS AND BUSINESS OPERATIONS.

- Promote the use of “green building” design elements, such as the Leadership in Energy and Environmental Design (LEED™) Green Building sustainable design, construction, and operations guidelines developed by the US Green Building Council, to increase production, lower overhead, and encourage more efficient business practices and a better standard of living.
- Encourage the use of clean and renewable energy sources.
- Incorporate green roofs to minimize impervious coverage.

OBJECTIVE 5: CONTINUE TO MAKE THE DEVELOPMENT REVIEW PROCESS MORE EFFICIENT AND EFFECTIVE.

- Ensure an effective regulatory framework is in place to accommodate current and future land use trends.
- Sustain sufficient staffing levels and the employment of accredited specialists to ensure timely and professional development review and planning activities.
- Further inter-agency collaboration by coordinating with other State, local, and Federal agencies to streamline the permitting process where possible.
- Continue to expand the role of technology as a public information and development review tool.

OBJECTIVE 6: PROMOTE STAKEHOLDER INVOLVEMENT IN PROTECTING DISTRICT PROPERTIES FROM LOSSES DUE TO NATURAL AND OTHER HAZARDS.

- Encourage property owners to floodproof existing structures located below the base flood elevation.
- Work to reduce the number of repetitive loss properties in the District.
- Effectuate the preservation of existing natural areas on developed lands.
- Encourage the minimization of impervious coverage areas on sites in the District.
- Encourage property maintenance activities by property owners, including regular inspection and maintenance of stormwater drainage systems, elimination of outdoor storage, provisions for refuse and recycling, maintenance of vegetation for fire prevention purposes, and maintenance of site improvements, including sidewalks and pavement, for public safety.
- Encourage coordination of site-specific activities in relation to regional initiatives in an effort to ensure no adverse impacts result from unanticipated circumstances. This objective is of particular importance within the Berry’s Creek Study Area, where regional flood control/resiliency initiatives and environmental remediation activities should be coordinated to achieve project goals in tandem.

OBJECTIVE 7: ENSURE THAT ECONOMIC DEVELOPMENT OCCURS IN SYNC WITH OTHER SYSTEMS.

- Accommodate economic development within the carrying capacity of the land and its surrounding environment.
- Promote both the economic and societal benefits associated with open space protection.
- Ensure the highest environmental standards continue to be applicable to land development in the Meadowlands District, including the use of clean fill and adherence to performance standards for including, but not limited to, air, water, noise, vibrations, glare, hazardous and radioactive materials, and wastewater, to avoid detrimental impacts to property and its surrounding environs.

➔ STRATEGIC ACTION PLAN – ECONOMIC DEVELOPMENT SYSTEM

1. Prepare amendments to District zoning regulations to implement the goals and objectives of this Master Plan, including changes to the Official Zoning Map to implement the 2020 Land Use Plan.
2. Prepare an updated Floodplain Management Plan for the District and attempt to obtain a higher-level classification within FEMA's Community Rating System (CRS) to reduce the cost of flood insurance to District property owners.
3. Evaluate recommendations within the "Sustainable Meadowlands: A Guide to Resiliency" plan (see [Chapter 9](#)) to promote the long-term viability and enhance the protection of properties in the District.

SYSTEM 3: TRANSPORTATION

The NJSEA will promote the improvement of the current transportation network and the ability of the Meadowlands District and its surrounding area to meet future demands. The following objectives will foster the availability of various modal choices, particularly public transit, walking, and biking, and will also promote the interconnectivity of the transportation network where necessary and feasible.

1. Enhance coordination and cooperation among local and regional transportation agencies.
2. Improve the inter-relationship between land use and the transportation system through the NJSEA's policies and regulations.
3. Promote efficient and livable communities within the District.
4. Encourage the use of public transit within a cohesive and integrated multi-modal transportation system.
5. Promote safe and efficient pedestrian and bicycle circulation.
6. Foster the development of an integrated intermodal freight system.
7. Increase safety for motorized and non-motorized users of the transportation system.
8. Foster evolving transportation technologies.

OBJECTIVE 1: ENHANCE COORDINATION AND COOPERATION AMONG LOCAL AND REGIONAL TRANSPORTATION AGENCIES.

- Develop and implement programs, projects, and plans to improve the regional transportation network in coordination with transportation stakeholders in the District, including the North Jersey Transportation Planning Authority (NJTPA), New York Metropolitan Transportation Council (NYMTC), the Port Authority of New York and New Jersey (PANYNJ), New Jersey Transit (NJ Transit), the New Jersey Department of Transportation (NJDOT), the New Jersey Turnpike Authority (NJTA), Bergen and Hudson counties, the MRC, the District's constituent municipalities, and environmental groups.
- Update the Meadowlands District Transportation Plan (MDTP) 2045 in consultation with regional transportation stakeholders to establish current guidelines on where and how to invest transportation dollars and to evaluate funding alternatives based on the following:
 1. Promoting the economic vitality of the District;
 2. Increasing mobility, safety and security for all motorized and non-motorized users, with emphasis on user-centric models, such as Mobility-as-a-Service (MaaS), utilizing multi-modal travel approaches including car, transit, bike share, and ride share;
 3. Protecting the environment; and
 4. Improving the quality of life.

- Coordinate with various entities managing transportation in the region on an ongoing basis in an effort to reduce traffic delays and improve travel time.
- Seek coordination and consistency among local and regional plans and approaches regarding improvements to roadways, railways, bike lanes, sidewalks, trails, and other modes of transportation, including the Regional Transportation Plan prepared by the NJTPA, and the Port Authority’s Comprehensive Port Improvement Plan. In addition, support strategic regional transportation projects, including NJDOT’s New Road project in Jersey City and NJ Transit’s Portal Bridge replacement and Gateway Tunnel projects.
- Ensure that transportation improvements maintain or enhance both the natural environment and public safety.
- Generate and maintain data for use in transportation and traffic studies, land use, and transportation modeling/simulation.

OBJECTIVE 2: IMPROVE THE INTER-RELATIONSHIP BETWEEN LAND USE AND THE TRANSPORTATION SYSTEM THROUGH THE NJSEA'S POLICIES AND REGULATIONS.

- Adopt uniform criteria with regard to the following:
 1. Identification of land use impacts upon the current capacity of the transportation network, including an assessment of the safety of vulnerable users of the transportation system, such as cyclists and pedestrians;
 2. Traffic impact studies prepared in connection with proposed development projects;
 3. Site plan design requirements promoting public health, safety, welfare, order, and convenience both on and off site; and
 4. Design guidelines to promote safe circulation on roadways, railways, and pedestrian/ bicycle facilities within the District.
- Evaluate emerging technologies and initiatives in transportation and assess their impacts to NJSEA land use policies and regulations, including requirements for electric vehicle charging stations.
- Continue to support investment in regional transportation improvements through the assessment of transportation mitigation impact fees via an equitable structure, correlating costs to the impacts projected to be generated by individual development projects.
- Promote implementation of “Complete Street” initiatives to enhance public safety and improve connectivity of the District’s pedestrian and bicycle network.



- Expand Transit Oriented Development (TOD) in the District through encouraging a mix of supportive uses proximate to transit services within a high quality walking and biking environment.
- Promote safe and efficient on-site circulation through the separation of truck and passenger vehicles, with provisions for dedicated safe routes within vehicular use areas for pedestrians and cyclists.
- Promote a desirable visual environment through landscape, screening, and buffering requirements.

OBJECTIVE 3: PROMOTE EFFICIENT AND LIVABLE COMMUNITIES WITHIN THE DISTRICT.

- Foster a user-centric transportation model that supports all modes of transport, including motor vehicle, walking, biking, and public transit.
- Promote affordable, accessible, and dynamic transport systems responsive to all current and future travelers' needs.
- Enhance system coordination, efficiency, and safety for people and goods across all modes of travel.
- Improve mobility at critical links in the transportation system by expanding access to transit facilities and implementing innovative technology and methods to reduce traffic, improve traffic flow, and increase safety.
- Reduce fragmentation and enhance system connectivity for all modes of travel within the District's transportation network.
- Create a cohesive transportation system that promotes the resiliency of the transportation network within and around the District.

OBJECTIVE 4: ENCOURAGE THE USE OF PUBLIC TRANSIT WITHIN A COHESIVE AND INTEGRATED MULTI-MODAL TRANSPORTATION SYSTEM.

- Promote efficient access to cultural, commercial, environmental, employment, and residential centers in the Meadowlands District.
- Encourage the use of alternative transportation modes, such as public transit (rail and bus), shuttle service, ridesharing services, bike sharing, and walking to reduce traffic within the District.
- Identify transportation network improvements to create seamless links among roadways, railways, and other related facilities within and around the District.
- Promote transit and paratransit enhancements for improved access and mobility by persons with disabilities and reduced mobility.
- Promote transportation interconnectivity measures among the various modes of transportation within and around the District, including the following:
 1. Park-and-ride facilities for bus and rail access;
 2. Multi-modal and intermodal access centers and transit villages that interconnect with other transit facilities;
 3. More efficient bus routing to avoid redundant or unnecessary service;
 4. Bus shelters at heavily used bus stops;
 5. Coordination with NJ Transit, EZ-Ride, and other bus and shuttle operators to provide more efficient service;
 6. Coordination of public transit modes and schedules, especially between bus and rail transfers;
 7. Improved and interconnected modal choices, including vehicle, public transit, walking, biking, and other forms of transportation for residents, employees and travelers within and through the District;
 8. Employee trip reduction programs that provide incentives to employees to use transit services;

9. Expanding the availability of bike sharing facilities in the vicinity of major transit hubs;
10. Creating and expanding rail and bus terminal drop-off/pickup zones for ridesharing;
11. Advancing Traveler Information System (TIS) for seamless connectivity; and
12. Advancing a unified fare collection payment system across transit systems.

OBJECTIVE 5: PROMOTE SAFE AND EFFICIENT PEDESTRIAN AND BICYCLE CIRCULATION.

- Focus on enhancing facilities for pedestrians and cyclists by identifying needs and initiating plans, through the MDTP 2045, to encourage these modes of transportation within the District.
- Coordinate with NJDOT, NJ Transit, Bergen and Hudson counties, and constituent municipalities in the planning, development, and improvement of pedestrian and bicycle trails.
- Encourage appropriate spatial orientation of structures in relation to the surrounding streetscape.
- Promote “Complete Streets” principles within and around the District through the creation of dedicated pedestrian areas and safe pedestrian linkages among public transit, employment centers, housing, services, and open space.
- Uphold requirements for the installation and maintenance of sidewalks along public streets in conjunction with development projects, and encouraging the installation of sidewalks in areas where segments are missing.
- Encourage improved access to and from transit facilities and adjacent land uses.
- Encourage the development of pedestrian walkways and bridges over major roadways to improve pedestrian safety.
- Encourage the development of waterfront esplanades.



OBJECTIVE 6: FOSTER THE DEVELOPMENT OF AN INTEGRATED INTERMODAL FREIGHT SYSTEM.

- Investigate freight capacity and expansion options.
- Support the improvement of rail links to expand freight capacity in and through the District in an effort to reduce truck trips.
- Encourage the location of intermodal uses and larger distribution sites near rail and highway infrastructure in accordance with the Industrial/Logistics Planning Area classification in the 2020 Land Use Plan.
- Promote the creation of dedicated truck routes through the District, encouraging use of major roadways and highways and restricting access through local streets and residential areas.
- Encourage freight movement by trucks during non-commuter peak periods.
- Promote the separation of rail and roadway crossings, especially at roadways that have moderate to heavy traffic volumes or pedestrian activity.
- Prepare an intermodal freight study to investigate the relationship of regional freight movement to the District.
- Encourage Foreign Trade Zone designation for appropriate locations in the District.

OBJECTIVE 7: INCREASE SAFETY FOR MOTORIZED AND NON-MOTORIZED USERS OF THE

TRANSPORTATION SYSTEM.

- Support implementation of the State of New Jersey’s and the USDOT’s vision for safety as provided in “Toward Zero Deaths: A National Strategy on Highway Safety” (“Toward Zero Deaths”), which calls for a national goal of reducing the number of traffic fatalities by half by the year 2030. New Jersey’s crash reduction goal is to reduce serious injuries and fatalities by 2.5 percent annually with the support of all safety partners.
- Develop a Comprehensive Traffic Safety Program (TSP), through in-depth analysis of local, county, and State roadways to identify high-frequency crash locations, and conduct a system-wide risk assessment. The TSP will include pedestrian and bicycle safety measures and travel demand management strategies.

OBJECTIVE 8: FOSTER EVOLVING TRANSPORTATION TECHNOLOGIES.

- Embrace new and emerging technologies within the District to improve the movement of people and goods throughout the District.
- Initiate pilot projects in the District to increase safety and mobility for all roadway users.
- Support the implementation of emerging technologies such as connected vehicles (Vehicle to Vehicle - V2V, Vehicle to Infrastructure - V2I, and Vehicle to Pedestrian - V2P) and autonomous vehicles (CV/AV), which allows communication between vehicles and smart traffic systems. Potential technologies include:
 1. Signal Phasing and Timing (SPaT): A SPaT message defines the current intersection signal light phases and any active pre-emption or priority. The current state of all lanes at the intersection is reported to drivers equipped with an onboard unit (OBU). This information is reported to the vehicle for speed adoption to eliminate dilemma zones, and reduce crashes.
 2. Pedestrian in signalized crosswalk warning (PSCW): This application provides a warning to a vehicle equipped with an onboard unit, including transit vehicles, indicating the possible presence of pedestrians in a crosswalk at a signalized intersection. The application could also provide warning information to the pedestrian regarding crossing status.

➔ STRATEGIC ACTION PLAN – TRANSPORTATION SYSTEM

1. Update the Meadowlands District Transportation Plan to identify and address current transportation network issues, challenges, opportunities, and improvements.
2. Review District zoning regulations to ensure current standards related to traffic impact assessments, circulation and site design, and parking requirements are being utilized.

SYSTEM 4: HOUSING

The NJSEA will advance a comprehensive Meadowlands District housing policy in collaboration with its constituent municipalities, predicated on the following objectives:

1. Permit the creation of additional housing units within existing residential areas or mixed-use development within the limits of available infrastructure, community facilities, and the natural environment.
2. Encourage the District’s municipalities to bring substandard housing to standard condition through a program of code enforcement and rehabilitation.

3. Spur the production of affordable housing in the region.
4. Accommodate demographic shifts to ensure a sufficient range of housing types is available to meet the needs of the region’s population.

OBJECTIVE 1: PERMIT THE CREATION OF ADDITIONAL HOUSING UNITS WITHIN EXISTING RESIDENTIAL AREAS OR MIXED-USE DEVELOPMENT WITHIN THE LIMITS OF AVAILABLE INFRASTRUCTURE, COMMUNITY FACILITIES, AND THE NATURAL ENVIRONMENT.

- Permit residential development in specified Neighborhood Planning Areas in the Hackensack Meadowlands District 2020 Land Use Plan.
- Ensure that prospective housing development assesses each project’s impacts to community services and carrying capacity, permitting housing only in suitable locations with access to appropriate roadways, utilities, schools, and emergency services to serve the projected increase in population.
- Collaborate with constituent municipal representatives to assess project impacts and determine mitigating measures.
- Promote the development of clustered or higher density housing, with the exception of infill housing in existing low density residential neighborhoods of the District.
- Accommodate housing in a location that is protective of the public health, safety, morals, and welfare and in a manner that avoids adverse impacts to the environment and natural resources of the District.

OBJECTIVE 2: ENCOURAGE THE DISTRICT'S MUNICIPALITIES TO BRING SUBSTANDARD HOUSING TO STANDARD CONDITION THROUGH A PROGRAM OF CODE ENFORCEMENT AND REHABILITATION.

- Enforce property maintenance codes in collaboration with municipal officials.
- Investigate programs and funding sources to assist municipalities and property owners to rehabilitate existing substandard housing.

OBJECTIVE 3: SPUR THE PRODUCTION OF AFFORDABLE HOUSING IN THE REGION.

- Identify and assess suitable sites to expand the supply of affordable housing in the District in appropriate locations. As there is very limited vacant land remaining in the District that could be suitable for residential development, opportunities for the accommodation of affordable housing will be investigated in the context of redevelopment of existing improved properties.
- Provide technical support to constituent municipalities in the preparation of municipal housing plans and assist in the identification and assessment of sites within the District where municipal affordable housing obligations may be suitably accommodated.
- Maintain regulatory flexibility by accepting requests for zoning changes, including density increases, to accommodate affordable housing development in suitable locations that are protective of the public health, safety, morals, and welfare.
- Promote equity and environmental justice in the accommodation of affordable housing in the District.



OBJECTIVE 4: ACCOMMODATE DEMOGRAPHIC SHIFTS TO ENSURE A SUFFICIENT RANGE OF HOUSING TYPES IS AVAILABLE TO MEET THE NEEDS OF THE REGION'S POPULATION.

- Encourage the production of age-restricted housing to accommodate the increasing aging population in Meadowlands communities.
- Expand the supply of housing, and particularly new rental housing, in safe, walkable environments with convenient access to transit and services.
- Combat practices discriminating against age, race, religion, disability, sexual orientation, or family status in housing accommodation.

➔ STRATEGIC ACTION PLAN – HOUSING SYSTEM

1. Prepare a District-specific demographic and housing market study.
2. Prepare a Meadowlands Housing Plan to identify and provide an implementation pathway to accommodate housing needs in the District.
3. Enact regulations to codify affordable housing requirements in the District upon completion of a Meadowlands Housing Plan.

SYSTEM 5: COMMUNITY FACILITIES

For the Meadowlands District to realize its full potential as a land resource of incalculable opportunity for new jobs, homes, and recreational sites, a strong supporting system of community facilities must be in place. The NJSEA will support community facilities through the following strategies:

1. Support the District's constituent municipalities in providing a suitable array of community facilities to accommodate anticipated population, employment, and economic growth.
2. Consider the support capacity of community facilities and private utilities when planning or reviewing types and levels of development.
3. Conduct appropriate analyses that support emergency planning.



OBJECTIVE 1: SUPPORT THE DISTRICT'S CONSTITUENT MUNICIPALITIES IN PROVIDING A SUITABLE ARRAY OF COMMUNITY FACILITIES TO ACCOMMODATE ANTICIPATED POPULATION, EMPLOYMENT, AND ECONOMIC GROWTH.

- Support municipal facilities planning, emergency management, and improvements to operations by continuing to offer access to Geographic Information System (GIS) data, in partnership with MERI, to assist with a myriad of municipal functions, including planning, zoning, fire, police, and public safety.
- Promote and expand the use of shared services where feasible.
- Advance coordination of the development review process with municipal construction offices.
- Increase the use of technology to provide more efficient and convenient public services, including online payments and permitting information.

OBJECTIVE 2: CONSIDER THE SUPPORT CAPACITY OF COMMUNITY FACILITIES AND PRIVATE UTILITIES WHEN PLANNING OR REVIEWING TYPES AND LEVELS OF DEVELOPMENT.

- Ensure proposed development is coordinated with utility providers to determine whether there is available capacity to service new projects, or if expansion of utilities or service units would be needed.
- Require project impact assessments for projects determined to have a potential impact on System Plan categories.

OBJECTIVE 3: CONDUCT APPROPRIATE ANALYSES THAT SUPPORT EMERGENCY PLANNING.

- Participate in comprehensive emergency planning to secure public health and safety at State and local facilities.
- Support disaster preparedness and mitigation activities by the District’s municipalities, particularly through the use of NJSEA and MERI technological resources.
- Identify risks to the District from flooding and develop mitigation strategies to eliminate or reduce the probability of losses in vulnerable areas.
- Limit public access to site and building plans for sensitive sites, such as chemical manufacturing facilities and schools.

➔ STRATEGIC ACTION PLAN – COMMUNITY FACILITIES SYSTEM

1. Formulate an updated comprehensive emergency response plan to ensure adequate response to natural and other hazards.

SYSTEM 6: HISTORIC RESOURCES

The NJSEA will strive to preserve, protect and sustain the unique historic and archaeological resources of the Meadowlands District.

OBJECTIVE: PRESERVE THE DISTRICT'S HISTORIC AND ARCHAEOLOGICAL HERITAGE.

- Consult with the NJ State Historic Preservation Office to refine the inventory of historic resources in the District.
- Assess the potential for preservation of historically-significant sites.

➔ STRATEGIC ACTION PLAN – HISTORIC RESOURCES SYSTEM

1. Prepare an updated inventory of historic sites in the District.
2. Provide an interactive map of past and present historically-significant sites in the District on the NJSEA website.



AREA PLANS

8

8. AREA PLANS

The Area Plans constitute the Land Use Plan for the Hackensack Meadowlands District. Area Plans present strategies for each of the Planning Areas that compose the Meadowlands District. Planning Areas do not constitute zoning districts; rather, the descriptions of the Planning Areas provide the basis for the development of an updated zone plan and regulations. The zone plan and regulations will be the mechanism by which the policies of the Master Plan are implemented and enforced.

I. PLANNING AREAS

A. PLANNING AREA DESIGNATIONS

The following Planning Areas together comprise the Land Use Plan established by this Master Plan:

1. Airport;
2. Commercial Center;
3. Employment Center;
4. Logistics / Industrial Center;
5. Neighborhoods;
6. Paterson Plank Road Corridor;
7. Preserve;
8. Secaucus Transit Center;
9. Sports and Entertainment Center;
10. Sustainable Uplands Reserve;
11. Transportation; and
12. Waterfront Development.

The properties within each Planning Area appear on [Map 16 – Land Use Plan](#), which depicts the vision for the location and arrangement of land uses within the District.

The following changes to the Planning Area classifications of the 2004 Land Use Plan have been made to the 2020 Land Use Plan, as follows:

- The Warehouse Outlet Center area classification was eliminated due to the transition of the retail outlet center in Secaucus to a predominantly warehousing and distribution center. While retail uses remain in certain locations, they are present in a more limited scope than had existed in the past, and the characteristics of the area no longer warrant differentiation from other employment centers.
- The Resort Recreation Community area classification has been eliminated to reflect changes to the Kingsland Redevelopment Plan, which changed the vision for the subject area from a

golf course community to the continuation of the warehouse employment center that exists in the vicinity of Valley Brook Avenue in Lyndhurst, as well as formulating a new sustainable vision for former landfills that cannot accommodate vertical development. The change was prompted in part by the enactment of State law prohibiting housing on former landfills.

- The “Utility” designation is now included in the Logistics/Industrial Planning Area.
- The residential areas of the District, termed “Villages” in the 2004 Land Use Plan, are now designated “Neighborhood” Planning Areas.
- The 2020 Land Use Plan does not differentiate various subcategories within Planning Area classifications. For example, the Preserve designation is not further delineated into the prior Hackensack, Berry’s Creek, and Penhorn Preserve Areas, as the planning goals and objectives apply to all areas within the category equally.

Figure 8.1 “Planning Areas – 2020 Hackensack Meadowlands District Land Use Plan” provides the acreage and percentage of the District occupied by each Planning Area, in order from largest to smallest.

Figure 8.1 PLANNING AREAS - 2020 HACKENSACK MEADOWLANDS DISTRICT LAND USE PLAN

PLANNING AREA	ACRES	PERCENT
Preserve	7,479.8	38.6%
Employment Center	3,252.2	16.8%
Transportation	2,846.5	14.7%
Logistics/Industrial Center	2,158.1	11.1%
Sustainable Uplands Reserve	1,110.4	5.7%
Airport	660.4	3.4%
Sports and Entertainment Center	584.9	3.0%
Neighborhood	407.8	2.1%
Commercial Center	391.4	2.0%
Secaucus Transit Center	174.0	0.9%
Paterson Plank Road Corridor	172.7	0.9%
Waterfront Development	157.8	0.8%
TOTAL AREA	19,396.0	100.0%

SOURCES: MERI GIS AND NJSEA

The Area Plans provide a broad plan for the District in the context of each area’s dominant land use characteristics. Future development in the District is expected to proceed in accordance with the Area Plans of the 2020 Land Use Plan. There are uses existing within individual planning areas that are not included within the Area Plan description, such as residential uses located within Employment and Commercial Centers, or wetlands within a non-Preserve Planning Area, such as those located within utility rights-of-way. It is not the intention of the Area Plans to suggest that wetlands located outside of a Preserve Planning Area are planned to be developed; it is a principal goal of this plan to preserve remaining wetlands in the District.

B. PLANNING AREA DESCRIPTIONS

The following summaries provide additional description regarding the locations and characteristics of the Planning Areas, in alphabetical order:



1. AIRPORT

The Airport Planning Area encompasses Teterboro Airport, which is owned and operated by the Port Authority of New York and New Jersey (PANYNJ) and subject to Federal Aviation Administration and PANYNJ regulations. The NJSEA has limited jurisdiction in regulating development on property owned by the PANYNJ. The Airport

planning area straddles the municipalities of Teterboro and Moonachie. Uses at the 827-acre airport include paved runways, taxiways, landing strips, and aprons; aircraft storage, service and hangar facilities; lighting, radio and radar facilities; aircraft fueling facilities; and private passenger terminal facilities. A significantly-sized portion of the Airport Planning Area includes forested wetlands.

Teterboro Airport is designated as a reliever airport and therefore does not accommodate scheduled carrier operations. The airport imposes a weight restriction that prohibits use by aircraft with operating weights in excess of 100,000 pounds. The Airport classification assumes Teterboro Airport will continue as a “general aviation reliever” airport along with related uses. All uses on and around the Airport are subject to height restrictions and established noise controls set by the Federal Aviation Administration.

Consistent with smart growth principles, regional considerations of sustainability must be valued over isolated actions. As such, as one of the few locations in the Meadowlands where forested wetland areas can be found, environmentally-sensitive portions of the Airport property must be preserved in their natural state. Properties in the adjoining Employment Center Planning Area are available to accommodate uses supportive of the Airport Planning Area.

2. COMMERCIAL CENTER

The Commercial Center Planning Area classification accommodates regional commercial retail opportunities, generally along major transportation corridors. In addition to recognizing existing commercial centers, this designation promotes the development of a range of commercial uses, including community commercial centers, highway commercial



development, big box retail, theme retail, commercial recreation facilities, and office/hotel development.

The Commercial Center Planning Area includes the following locations:

- A portion of the Town of Secaucus in the vicinity of Route 3, principally composed of commercial properties in the Harmon Meadow and Mill Creek developments and those containing frontage along Paterson Plank Road. Some properties in this area, which had been within the Commercial Corridor designation in 2004, are reclassified to other planning areas in this Master Plan due to visibility, access, and/or circulation constraints that affect the feasibility of accommodating commercial uses on these properties, and to encourage a mix of uses within the area with varying peak hours of travel in an effort to minimize new traffic impacts.
- The Meadowlands Plaza area in East Rutherford, containing office space and the Hilton Meadowlands hotel development proximate to Interchange 16W of the New Jersey Turnpike.
- A portion of the Town of Kearny in the southwesterly part of the District, containing the site of a Wal-Mart Supercenter and associated strip commercial development, which was developed pursuant to the Kearny Area Redevelopment Plan.
- A portion of the Borough of Teterboro, containing the mixed-use Teterboro Landing development at the intersection of Route 46 and Industrial Avenue, which was developed in the early 2010's pursuant to the Teterboro Industrial Avenue Redevelopment Plan at the former Honeywell site. The property contains Costco and Wal-Mart retail anchors, a warehouse, and a number of restaurants and other retail tenants.
- Planning considerations for the Commercial Center Planning Area include the provision of a diverse mix of commercial uses within these areas, careful consideration of circulation impacts, including a safe pedestrian environment, and the provision of adequate parking.

3. EMPLOYMENT CENTER

The Employment Center Planning Area contains the workplaces for a relatively large number of the District's employment population. The centers may include a mix of land uses such as office, warehouse and distribution facilities, and light industrial facilities. The planning area also supports flex space and research facilities. The Area Plan calls for centers with a concentration of industrial and warehouse distribution businesses, business and professional services, and the continuation of office development.



Employment Centers are located in the following areas:

- A section of Teterboro in the vicinity of Industrial and Malcolm Avenues, west of Teterboro Airport;

- The portion of Little Ferry in the vicinity of Industrial Avenue and Gates Road;
- Properties in Carlstadt/Moonachie/South Hackensack in the general vicinity of Moonachie Avenue, Moonachie Road, Washington Avenue, and Gotham Parkway;
- The section of East Rutherford in the vicinity of Murray Hill Parkway and East Union Avenue;
- A portion of Lyndhurst in the vicinity of Wall Street West, Valley Brook Avenue, and Polito Avenue;
- A section of Kearny in the vicinity of Barczewski Street;
- The portion of Secaucus generally between Meadowland Parkway and County Avenue;
- Properties in North Bergen and Secaucus along the westerly portion of West Side Avenue and in Secaucus on properties in the vicinity of, but without direct access to, Paterson Plank Road; and
- A section of Ridgefield in the vicinity of Railroad Avenue.

Employment centers have been adept at adapting to current market conditions, where, for example, Bergen Community College has opened a satellite campus within vacant office space. Some properties within the Employment Center classification have also been deemed



suitable to accommodate housing development in an effort to promote affordability for residents and workers in the region.

Planning considerations for this classification include maintaining a high level of transit services available to these areas, and providing for limited complementary commercial uses to support the needs of the workforce within this area.

4. LOGISTICS/INDUSTRIAL CENTER

The Logistics/Industrial Center Planning Area classification encompasses properties that are traditionally associated with heavy industry in the Meadowlands. They include heavy industrial and logistics facilities, warehouse and distribution facilities, public utility uses, and intermodal rail facilities. Logistics uses involve the combination of transportation, assembly, processing and delivery of goods, and often require multiple transportation modes to get goods from manufacturers to the consumer market. Intermodal uses have a particular reliance on the trucking industry.



The Land Use Plan designates the following locations as Logistics/Industrial Center Planning Areas:

- Portions of Ridgefield including the Little Ferry Intermodal Rail Yard (currently closed), an automotive terminal, and PSE&G's Bergen Generating Station and electrical substation and switching station.
- An area of North Bergen between Bellman's Creek and the easterly border of the District;
- A portion of the Bergen County Utilities (BCUA) property in Little Ferry proximate to the Hackensack River;
- A section of Lyndhurst along the westerly border of the District;
- An area of North Bergen located north of Route 3, between West Side Avenue and the Northern Branch Rail Line, where transload facilities are also present;
- The majority of the in-District portion of Jersey City and adjoining parcels in the vicinity of Secaucus Road in North Bergen and Secaucus; and
- A portion of the Town of Kearny south of Kearny Marsh from the Hackensack River to the western border of the District, including the Koppers Coke Peninsula Redevelopment Area.

The NJSEA will continue to accommodate the heavier industrial and logistics needs of the region in appropriate locations, in balance with the impacts of these uses to the environment and their surroundings.

5. NEIGHBORHOODS

The Neighborhood Planning Area encompasses existing residential areas within the municipalities of East Rutherford, Little Ferry, Lyndhurst, Moonachie, Secaucus, and Teterboro. The dominant form of residential development in these areas consists of single- and two-family houses on small lots. This designation also includes two mobile home parks that have been located for many decades on Moonachie Avenue in Moonachie. Most new housing development in the District since 2004 has been in the form of mid-rise rental apartments.



The Neighborhood area classification generally seeks to protect and maintain the existing one- and two-family residential areas and to promote the continuation of this development scale within established residential neighborhoods. Neighborhoods also contain parks and small-scale retail and service establishments intended to principally support the residential uses in the area. Certain locations within Neighborhood Planning Areas may be suitable to support higher-density housing to accommodate the provision of affordable housing.

A newly-classified Neighborhood in the District is comprised of the Monarch residential development and the vacant Eastbound site, zoned for residential use, along the Route 3 East Service Road in East Rutherford. In addition, the Neighborhood Planning Area in Lyndhurst has been expanded to include the Vermella residential development along Orient Way.

It is the intent of this plan to encourage a safe pedestrian environment within these

neighborhoods, and to ensure that appropriate buffers from more intense uses are provided to minimize negative impacts to residential uses.

6. PATERSON PLANK ROAD CORRIDOR

The Paterson Plank Corridor Planning Area boundary aligns with the District's synonymous redevelopment area in Carlstadt and East Rutherford, along Paterson Plank Road between Route 17 and Washington Avenue, adjacent to the Meadowlands Sports Complex. The entrance to the Gotham Industrial Park in Carlstadt is also located along this corridor.



This planning area is also home to two USEPA Superfund sites, which are in the process of remediation. The Scientific Chemical Processing (SCP) site in the Borough of Carlstadt has been acquired by the Borough and is the site of a planned ballast-mounted photovoltaic installation, which will avoid compromising the site's remedial measures. The Universal Oil Products (UOP) site in East Rutherford has been placed on the Federal Emphasis List of Superfund sites, which prioritizes the cleanup of the property. The first two phases of the site's cleanup have been completed, included addressing contaminated soils in the uplands portion of the site and contaminated groundwater. The third phase, which involves addressing contaminants in the sediment of wetlands and Ackerman's Creek, a tributary to Berry's Creek, is currently under investigation. The selected remedial activity for the UOP site will be heavily influenced by the Berry's Creek Study Area (BCSA) (which is part of the Ventron/Velsicol Superfund site), where a consortium of over 100 Potentially Responsible Parties, are working to clean up Berry's Creek tidal waterways and marshes. This location is also the subject of planned flood control projects in association with the Rebuild by Design Meadowlands project, more fully explained in [Chapter 9 – Sustainable Meadowlands](#). Coordination of projects within this Planning Area is essential to ensure that the various projects achieve their goals in a complementary manner, to preclude any unanticipated or deleterious consequences.

The Paterson Plank Road Corridor Planning Area is intended to be redeveloped as a significant destination point for visitors and supportive businesses in conjunction with the sports and entertainment venues and the American Dream development at the Meadowlands Sports Complex site. The planning area currently contains a mix of industrial and commercial uses, with an emergent trend toward hotel development. Development interest in area properties is increasing with the impending opening of the American Dream complex.

The Land Use Plan envisions a combination of commercial and entertainment uses along the frontage of Paterson Plank Road. Residential uses are not contemplated in this Planning Area due principally to environmental concerns, the character and configuration of the roadway network, and the lack of safe connections to supportive uses in the neighborhood core outside the District boundary. Office, retail, and hotel uses are planned in a comprehensive manner to

coordinate the various commercial uses and to provide adequate access and parking. Properties within the area that do not contain frontage on Paterson Plank Road are intended to be occupied with light industrial uses, which may also provide support to the sports and entertainment venues and the American Dream development at the Meadowlands Sports Complex. It is anticipated that large-scale development of this area will require the market-driven assembly of properties.

7. PRESERVE

The Preserve Planning Area classification is comprised of the Hackensack River, its tributary network, and adjoining lands in the District. The Hackensack River system is recognized as a defining attribute of the Meadowlands District, and this category includes most of the existing wetland areas in the District. Some uplands are also included within this Planning Area, particularly along the Hackensack River where they are important for recreation, habitat, or open space protection.



The Preserve Planning Area permits uses that are consistent with the preservation of open space and habitat protection and enhancement. Wildlife management areas are encouraged. The plan promotes the formulation of a habitat enhancement program for the

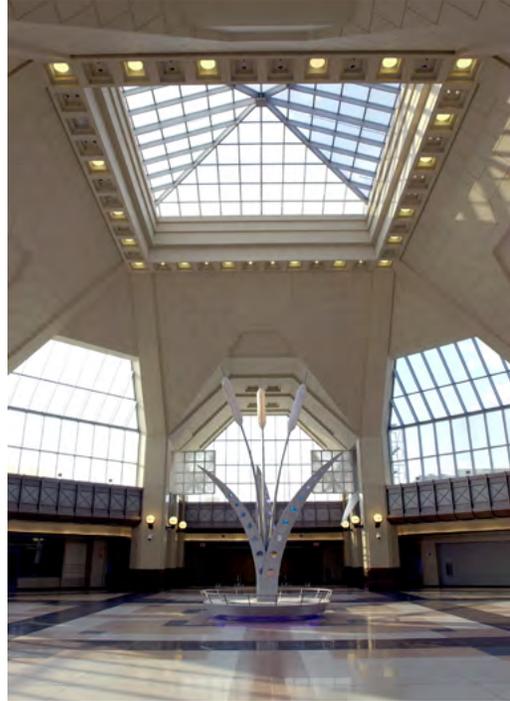


Preserve Planning Area, as well as edge parks and waterfront park areas for the public. Preserve Planning Areas also accommodate existing public utilities and radio towers. Wetland restoration and/or mitigation is provided in connection with programs and regulations of other State and Federal agencies.

The Preserve area classification will promote the protection of wetlands remaining in the District, with the intent of full public ownership. The 2004 Master Plan had placed 7,128.7 acres of District land area within a Preserve Planning Area. The 2020 Land Use Plan expands this classification to approximately 7,480 acres, an increase of approximately 400 acres. The 2004 Master Plan also set a goal for the acquisition of approximately 2,600 acres of wetlands. To date, the NJSEA, the Meadowlands Conservation Trust, and other entities have acquired and/or otherwise enabled the permanent preservation of 3,544 acres of environmentally-sensitive wetlands in the District, an increase of approximately 1,066 acres since 2004. The NJSEA is committed to further expanding implementation of this principal goal for the District as funding becomes available for acquisition, restoration, and maintenance of Preserve lands.

8. SECAUCUS TRANSIT CENTER

The Secaucus Transit Center Planning Area is located in the vicinity of the Frank R. Lautenberg Station at Secaucus Junction and New Jersey Turnpike Interchange 15X. Secaucus Junction connects every major rail commuter line in northeast New Jersey and allows transfers to reach various destinations in the region. Operated by NJ Transit, Secaucus Junction provides direct, interrelated train operations among NJ Transit's Bergen and Main Line, Amtrak, and the Northeast Corridor Line. The Bergen Line carries trains from the Pascack Valley Line and Meadowlands Rail Link. The Northeast Corridor carries trains from the Raritan Valley Line, the Montclair Branch, the Boonton Line, and the Jersey Shore Line via Newark Penn Station. Various bus lines and shuttles also service the transit station.



The transit station is the focal point of a major development node that has served as the impetus for significant redevelopment in the area, including the construction of 1,548 units in a multifamily transit-oriented residential development on the site of a former ash landfill. Permitted uses immediately above, through vertical development, and adjacent to Secaucus Junction include retail, office, hotel, parks, and residential development. The Planning Area is also home to the newly-constructed Hudson County High Tech High School and proximate to Hudson County's Laurel Hill Park. Development approvals issued in the 1990s pursuant to the former Transportation Center Specially Planned Area permit office and other complementary commercial development above the transit station.

Planning goals for this area include supporting the ongoing redevelopment of the area's industrial character into uses consistent with the redevelopment plan for the area, inclusive of promoting vertical development above surface commuter parking lots, as well as promoting commercial development above Secaucus Transfer, to encourage the creation of a true transit village at Secaucus Junction. Potential development in this planning area must take special consideration of traffic and its potential impacts to the capacity of the local and regional street network. Development that favors usage of the area's mass transit infrastructure as a destination, as opposed to a starting point, is preferred. Safe pedestrian and bicycle connections to the transit station must be included as a part of any new development in this area.

9. SPORTS AND ENTERTAINMENT CENTER

The Sports and Entertainment Center Planning Area encompasses the majority of the Meadowlands Sports Complex property, which is owned by the NJSEA. While a portion of the property is occupied by the Berry's Creek Tidal Marsh, known as Walden Swamp, which is designated as part of the Preserve area classification, the Sports and Entertainment Center classification applies to the site of MetLife Stadium, which opened in 2010 and replaced the

former Giants Stadium; the Meadowlands Racetrack, which includes a new grandstand that opened in 2013; and the American Dream Meadowlands entertainment and retail destination. The former arena at the site ceased operating as a sports and entertainment venue in 2015.

The Sports Complex and its facilities are one of the most readily-recognized features of the Meadowlands, located at the center of the District and visible from various viewpoints in and around its environs. The events held at the Sports Complex are highly attended, each bringing thousands of people into the Meadowlands area. The District Master Plan does not apply to



the NJSEA-owned Meadowlands Sports Complex property; however, it recognizes the need to coordinate the complex’s planning outcomes with those of this Master Plan, particularly with regard to surrounding land uses and transportation planning efforts.

10. SUSTAINABLE UPLANDS RESERVE

The Sustainable Uplands Reserve Planning Area designation is associated with landfill areas in Rutherford, Lyndhurst, North Arlington, Secaucus, and Kearny, including the Keegan Landfill and the former Viola, Avon, Rutherford, Kingsland, Erie, 1-A, 1-D, 1-E, Mall, and Malanka Landfills.



The principal objectives of this area classification are to properly close the landfills using techniques that are proven to protect the environment, and, thereafter, to allow for uses that promote economic development in a manner that avoids negative impacts to the environment. Landfills in the Sustainable Uplands Reserve Planning Area may be utilized for the installation of renewable energy facilities, such as the NJSEA’s photovoltaic installation atop the former 1-A Landfill in Kearny, along with other forms of environmentally sound development that can reasonably be accommodated on landfill areas given site constraints while preserving the integrity of remedial/closure measures.

The plan also envisions the conversion of landfills and adjacent areas to open space and/or recreation areas. Former landfill areas also present an opportunity to create upland habitats in synergy with adjoining wetlands ecosystems. Landfill areas, with their history of scarring the Meadowlands landscape, will be repurposed to benefit the Meadowlands environment and economy.

11. TRANSPORTATION

The Transportation Planning Area classifies roadway and rail rights-of-way (ROW's) throughout the District. The characteristics of the District's roadway and railway network are discussed in detail in [Chapter 6 – Circulation](#), and specific objectives for the District's transportation network are provided in [Chapter 7 – Systems Plan](#).



The NJSEA recognizes the importance of maintaining and improving the District's transportation network, and the need to coordinate closely with stakeholders and other entities with jurisdiction over District ROWs, including District municipalities, Bergen and Hudson Counties, NJDOT, NJ Turnpike Authority, and NJ Transit. The Meadowlands District

Transportation Plan (MDTP), last adopted in 2007, identifies transportation needs, recommends specific improvements, and estimates costs of improvements over a time frame that reaches to the year 2030. The MDTP is currently being updated.

12. WATERFRONT DEVELOPMENT

Waterfront Development Planning Areas are located adjacent to the Hackensack River at the following locations:

- In Secaucus on lands located along the Hackensack River from Harmon Cove Towers in the south to Paterson Plank Road in the north, including Harmon Cove, Hudson Regional Hospital, and a number of office, hotel and residential developments along the riverfront.
- The easterly portions of Carlstadt and East Rutherford located at the foot of Paterson Plank Road along the Hackensack River, including small marina facilities and the site of a former golf driving range that is slated for residential development pursuant to court order.
- In a small portion of Little Ferry containing a mix of industrial and small-scale residential properties at the northern District boundary.



Since most of the Hackensack River frontage is wetland, there are limited locations where upland areas have opportunities to interface with the river. For those locations, comprehensive design planning will maximize the waterfront opportunities for recreation and access to the water. These activities include pedestrian walkways, restaurants, marinas/boat launches, related commercial activities and, in certain portions, residential development. Any development should provide for public access to the waterfront and to pedestrian walkways.

Design standards will require commercial development to be constructed at a scale that will allow the river to play an important visual role in how the buildings are viewed and how the mix of uses are integrated into the water's edge.

II. PLAN COMPARISONS

The plan comparisons of this section are prepared in an effort to determine the existence of any inconsistencies between the District Master Plan and the plans of associated governmental and regional entities. Comparisons are made with the most recent plans of the District's constituent municipalities, municipalities adjacent to the District boundary, Bergen and Hudson counties, the Regional Plan Association, the North Jersey Transportation Planning Authority, and the State via the New Jersey State Development and Redevelopment Plan and the New Jersey Coastal Management Plan.

A. NEW JERSEY STATE DEVELOPMENT AND REDEVELOPMENT PLAN

The New Jersey State Development and Redevelopment Plan (SDRP) was adopted by the New Jersey State Planning Commission on March 1, 2001. For lands within the jurisdiction of the NJSEA, the SDRP relies on the District Master Plan to implement the objectives of the SDRP, while recognizing the NJSEA as a nationally and internationally recognized model of integrated regional planning and development review. Although the SDRP does not include the Hackensack Meadowlands in its jurisdiction, lands in the District zoned for development are identified as Smart Growth Areas, pursuant to the Smart Growth Map adopted by the New Jersey Meadowlands Commission (NJMC) on September 21, 2009, in Resolution 09-68. The smart growth principles from the 2004 NJMC Master Plan were utilized to designate the Hackensack Meadowlands District (HMD) as a "Smart Growth Area." The NJMC Master Plan and Smart Growth Map present a comprehensive strategy for coordinated, planned growth and redevelopment opportunities that promote efficient use of land and encourage reinvestment of resources and efficient transportation systems. The Smart Growth Map encompasses all properties within the HMD boundaries, except the properties within the Sports and Exposition zone.

Both the SDRP and the District Master Plan include policies that direct growth to appropriate areas containing existing infrastructure, while preserving environmentally sensitive lands. The Master Plan embraces the SDRP's key concepts, such as sustainable development, smart growth, strong connections between transportation and land use, and capacity-based planning. The plan comparisons of this chapter address the goal to coordinate planning at all levels of government.

B. NEW JERSEY COASTAL MANAGEMENT PLAN

New Jersey's Coastal Management Program (NJCMP) is a networked program comprised of many offices within the New Jersey Department of Environmental Protection (NJDEP) with the shared responsibility of managing New Jersey's coastal resources. The NJCMP supports the planning component of the federally-approved National Coastal Zone Management (CZM) Program. The NJCMP is charged with developing and implementing long-range planning projects pertaining to coastal resource issues, inclusive of sustainable and resilient coastal community planning and climate change, and coordinating with related programs.

The NJSEA acts as the lead coastal planning and management agency for the Meadowlands District. Proposed changes in NJSEA plans or policies are reviewed by the NJDEP for incorporation into

the NJCMP. The program's emphasis is upon the continued protection of wetlands and other environmental resources.

The NJSEA Master Plan is generally consistent with the above-mentioned strategies of the NJCMP and the following eight broad coastal goals upon which the NJCMP and Coastal Zone Management Rules are founded:

1. Healthy coastal ecosystems;
2. Effective management of ocean and estuarine resources;
3. Meaningful public access to and use of tidal waterways and their shores;
4. Sustained and revitalized water-dependent uses;
5. Coastal open space;
6. Safe, healthy and well-planned coastal communities and regions;
7. Coordinated coastal decision-making, comprehensive planning and research; and
8. Coordinated public outreach and education.

C. NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY (NJTPA)

The NJTPA is the federally authorized Metropolitan Planning Organization for the 13-county northern New Jersey region, which includes the District. The NJTPA's current Regional Transportation Plan (RTP), "Plan 2045: Connecting North Jersey," was approved in November 2017 and presents a long-range vision for the transportation system serving the NJTPA region, including Bergen and Hudson counties. The RTP must be updated every four years. The current update is guiding the region to improve and adapt its transportation system to become more competitive, efficient, livable, and resilient. The goals of the RTP include:

- Protect and improve natural ecosystems, the built environment, and quality of life.
- Provide affordable, accessible, and dynamic transportation systems responsive to all current and future travelers.
- Retain and increase economic activity and competitiveness.
- Enhance system coordination, efficiency, overall safety and connectivity for people and goods across all modes of travel.
- Maintain a safe, secure, and reliable transportation system in a state of good repair.
- Create great places through select transportation investments that support the coordination of land use with transportation systems.
- Improve overall system safety, reducing serious injuries and fatalities for all travelers on all modes.

The Plan provides a framework for how the region can maintain and improve its transportation network through 2045. Through the use of corridor planning areas, the RTP establishes a method to identify critical areas of congestion and areas with safety issues that affect mobility and accessibility in the region, including portions of the District. One of the RTP's main objectives is to preserve and maintain the region's existing highway, bridge, and mass transportation systems by providing enhancements that will accommodate changes to travel demand. The majority of the activities attributed to the RTP are described in the NJTPA's Unified Planning Work Program (UPWP), which outlines the process that the NJTPA will follow in developing broad system wide transportation studies and project analyses.

D. COUNTY OF BERGEN

Bergen County’s “Part I Master Plan of Bergen County, State of New Jersey” was adopted December 10, 1962, with amendments adopted March 14, 1966, as well as a “1978 Generalized Land Use Plan” designating a variety of uses in the District, including public-quasi public, open space, industrial and office, transportation, utilities, communication, residential, commercial, and vacant land. The plans also promoted the protection of open space and streams, particularly in Lyndhurst.

The most recent planning document prepared by Bergen County is from June 2011, entitled “Vision Bergen, The Visioning Component of the Bergen County Master Plan,” which will be incorporated within a new Bergen County Master Plan to be adopted in 2020. The document includes an analysis of County demographics, economy, land use, housing, transportation, sewer and water infrastructure, community services, and environmental characteristics. The vision process resulted in suggestions by the public to emphasize open space preservation (including habitats and recreation areas), floodplain management, and redevelopment of brownfields. These suggestions are consistent with the priorities of this Master Plan.

E. COUNTY OF HUDSON

The 2016 Hudson County Reexamination Report was adopted by Hudson County on February 21, 2017, and serves as a Reexamination and update to the 2002 Hudson County Master Plan and 2008 Reexamination Report. The report’s purpose is to “help the County and its municipalities incorporate smart growth and sustainable community approaches into their development plans, regulations, and hazard mitigation goals and objectives, particularly to increase their flood resilience.” The report includes an assessment of demographics, housing, land use, transportation, the environment, economy, and other county policy priorities.

Hudson County’s planning goals and objectives as they relate to the District, particularly the focus on brownfields redevelopment, resiliency efforts, and environmental efforts align with the goals of this Master Plan. Specific goals of the report that reference the NJSEA include Conservation Goal 2, Objective b: “Assist the NJSEA in providing public access to educational programs, for wetlands and other key environmental areas of the Meadowlands.” The report includes recognition of the Hackensack Meadowlands as a “critical ecological and environmental resource for Hudson County,” and also seeks to maximize the Hackensack River waterfront as an asset for economic development where appropriate.

F. MUNICIPALITIES OF THE MEADOWLANDS DISTRICT

1. CARLSTADT

The Borough of Carlstadt’s 2013 Master Plan Reexamination Report is the fourth reexamination of its 1978 Master Plan; earlier reexaminations were conducted in 1989, 1999, and 2006. The 2013 Reexamination Report states the Borough’s location within the Hackensack Meadowlands District is generally responsible for the land use patterns that exist in that part of the Borough. Similar to the District Master Plan, the Borough emphasizes the importance of sustainability and mitigating the effects of development on the environment, including wetland areas. The properties in the Borough adjacent to the District boundary are located between Route 17 and the NJ Transit Pascack Valley rail line, and are zoned Commercial. The 2020 District Land Use Plan classifications of Paterson Plank Road Corridor and Employment Center Planning Areas along the District boundary provide for complementary land uses between the two jurisdictions.

2. EAST RUTHERFORD

The Borough of East Rutherford's 2006 Master Plan Reexamination Report contains planning concepts compatible with the goals of the NJSEA in this District Master Plan. The 2006 Reexamination Report identifies the "Paterson Plank Road Redevelopment Project" as an adopted plan in the District. The redevelopment area is located along the border of the District and creates complementary uses in East Rutherford on both sides of the District boundary. The Reexamination Report envisions that future land uses will complement the American Dream project and that Paterson Plank Road will be a main gateway to this destination. Areas along the District boundary line fronting Route 17 are zoned and developed with commercial uses. The 2020 District Land Use Plan classifies areas along the District boundary as Paterson Plank Road Corridor, Preserve, and Employment Center Planning Areas.

3. JERSEY CITY

Jersey City's 2000 Master Plan seeks to "coordinate land use policies in sections of the City that are within the Hackensack Meadowlands District" with the NJSEA. The area contains a former Public Service Electric and Gas generating station in the process of being decommissioned, the Croxton rail yard, and a US Postal Service bulk mail facility. Jersey City's Land Use Plan designates the in-District portion for industrial use, consistent with the 2020 District Land Use Plan classification of Logistics/ Industrial Center Planning Area for this area. The City's plan states that "careful site planning is required to adequately screen industrial activity and buffer adjacent residential and commercial districts." The plan further recommends frequent consultation with the NJSEA about planning issues and development within the District. Subsequent plan reexaminations, the most recent occurring in 2016, did not address any changes specific to the District. The 2020 District Land Use Plan classifies areas along the District boundary as Logistics/Industrial Center Planning Area.

4. KEARNY

The Town of Kearny's 2008 Master Plan Reexamination Report/Master Plan Revision have a number of District-specific objectives, including the redevelopment of contaminated sites, investment in the regional transportation network, enhancing connections between the Town and the Meadowlands, and the establishment of linkages between Town, Hudson County, and District recreational facilities. In addition, the Kearny Urban Enterprise Zone (KUEZ) includes areas within the District. Along the District's westerly boundary, the Town's Schuyler Avenue Redevelopment Plan proposes to revitalize the area between the east side of Schuyler Avenue and the District's westerly boundary with a combination of new commercial, light industrial, mixed-use residential, and recreational uses. The portion of Kearny to the south of the District boundary is zoned industrial. Areas within the District along the jurisdictional boundary lines are located in the Employment Center, Sustainable Uplands Reserve, Logistics/Industrial Center, and Commercial Center Planning Area classifications within the District's 2020 Land Use Plan. Presently, the municipality does assume control over the zoning and development as permitted by the Hackensack Meadowlands Agency Consolidation Act.

5. LITTLE FERRY

The Borough of Little Ferry adopted a Master Plan Reexamination Report in 2016. Among the recommendations found in the Reexamination Report, the Borough emphasizes the importance of resiliency, including a special review process for building in flood hazard areas; similarly, the

NJSEA's planning goals and zoning requirements promote resiliency through robust floodplain management activities. The plan also suggests improving access to the Hackensack River, including the portions of the municipality within the District. In addition, the Borough calls for enhancing "Gateways" to the Borough to create "a sense of arrival," consistent with the NJSEA's Systems Plan objective to cultivate a sense of place unique to the District. Furthermore, the report recommends examining brownfield sites located in the vicinity of the Hackensack River to determine their redevelopment potential and to develop a clean-up plan.

The 2016 Report recommends the Borough coordinate with the NJSEA to eliminate any discrepancies in zoning and future land uses. Additionally, the Borough would like the NJSEA to conduct a preliminary investigation to determine if the Bergen Turnpike area, Hackensack Waterfront, Route 46 Downtown and Tilcon site meet the criteria for an area in need of rehabilitation. Last, the Borough looks to coordinate with the NJSEA on a number of flood-related policies, including the preparation of a regional stormwater management plan, flood protection strategies, and expanded participation in the National Flood Insurance Program's Community Rating System to increase flood insurance discounts. The 2020 District Land Use Plan continues the Waterfront Development, Neighborhood, and Preserve Planning Area classifications within the Borough.

6. LYNDHURST

The Township of Lyndhurst's 2014 Reexamination Report expresses concern over residential development within the District. The municipality identifies the area along the District boundary as disjointed from the existing neighborhoods and shopping centers. Lyndhurst also recommends that industrial, commercial and open space uses be provided in areas under NJSEA jurisdiction, where currently much of the land within the District is zoned industrial and open space/preserve. The 2020 District Land Use Plan designates much of the District's area within Lyndhurst as Employment Center, with former landfill areas not amenable to vertical development as Sustainable Uplands Reserve. In addition, the Lyndhurst Recreation Center and adjoining residential development is placed in the Neighborhood Planning Area, with environmentally sensitive wetland areas placed within a Preserve Planning Area.

7. MOONACHIE

The Borough of Moonachie adopted a 2017 Post-Sandy Master Plan Reexamination Report, which focuses on resiliency. The Reexamination Report promotes buffers from waterways, improved drainage systems for low-lying areas, and additional open space. The Borough also identifies the two mobile home parks within the District as providing affordable housing. The 2020 District Land Use Plan continues the 2004 Land Use Plan classifications for Airport, Employment Center, Neighborhood, and Preserve Planning Areas within the Borough.

8. NORTH ARLINGTON

The Borough of North Arlington's 2003 Master Plan and 2016 Master Plan Reexamination Report outlined goals and objectives for the municipality. An express goal of the plan is to provide proper access to the District. In addition, the Borough's Porete Avenue Redevelopment Area is located adjacent to the District boundary, which allows for a variety of light industrial uses that are complementary to the uses within the District. The 2020 District Land Use Plan places adjoining areas within a Sustainable Urban Reserve and Preserve Planning Areas.

9. NORTH BERGEN

The Township of North Bergen's 2009 Reexamination Report of the 1987 Master Plan seeks improvement and redevelopment of the Township's industrial areas, as well as separation and buffers between incompatible land uses. The rail line forming the District's easterly boundary serves as a firm physical demarcation between the thriving industrial and office properties lining West Side Avenue and those areas transitioning to commercial usage in the out-of-District portions of the municipality. The 2020 Land Use Plan for the District classifies the properties within North Bergen along the easterly District boundary line within the Logistics/Industrial Center Planning Area, which is consistent with the adjoining rail and industrial operations along the District boundary line in the Borough.

10. RIDGEFIELD

The Borough of Ridgefield's 2009 and 2003 Reexamination Report of its 1989 Summary Master Plan and 1988-89 Land Use Plan identifies establishing substantial scenic and stream corridors along the Hackensack River frontage area as an objective. Since the land is under the jurisdiction of the NJSEA, the Borough emphasizes the importance of cooperation between the municipality and the agency. In the 2009 Report, the Borough recommended that "remaining vacant lands along the Hackensack River be rezoned for Marshland Preservation, with a 300-foot deep Scenic and River Corridor along the Hackensack River banks." A large area of the Borough in the District is located within a Preserve Planning Area, consistent with this goal.

The properties located along the District boundary include light manufacturing, industrial, commercial, and public/semipublic. The 2020 District Land Use Plan designates lands along the District boundary as Logistics/Industrial Center Planning Area, which is consistent with adjoining uses in the Borough.

11. RUTHERFORD

The Borough of Rutherford's most recent planning document is its 2007 Master Plan. The Borough's Master Plan shares policies similar to the NJSEA's planning objectives, including the encouragement of green buildings, promoting alternate means of transportation, preserving wetlands and open space, and reducing sprawl. In addition, the NJSEA, in cooperation with the Borough, designated properties in the vicinity of Highland Cross as an area in need of redevelopment, encompassing approximately 30 acres of land located within and outside of the District. The 2020 District Land Use Plan places the redevelopment area within the Employment Center Planning Area, which is consistent with existing uses adjoining the District boundary line in the Borough.

12. SECAUCUS

Over 89 percent of the land area of the Town of Secaucus is located within the District. The Town's 2009 Master Plan Land Use Element identifies a number of objectives pertaining to the District. The Plan's goals include the protection of natural resources, including an objective to work with the NJSEA towards restoration of important wetlands areas. The Plan expressed interest in establishing incentives for the creation of public open space amenities including the extension of the Hackensack Riverwalk. These objectives are similar to those established in the District Master Plan, specifically the Preserve Planning Area which seeks to protect and enhance these wetland areas. The Secaucus Land Use Plan map shows the lots located adjacent to the District boundaries contain similar and complementary uses; many of the out-of-District

parcels include residential and light industrial uses. The parcels located within the District complement these uses with residential, neighborhood commercial, and industrial uses as well, resulting in a comprehensive plan providing for a variety of uses within distinct areas of the municipality. Presently, the Town has assumed control over the zoning and development as permitted by the Hackensack Meadowlands Agency Consolidation Act.

13. SOUTH HACKENSACK

The Township of South Hackensack's 2018 Master Plan Reexamination Report was adopted in May 2019, updating the Township's 2008 Master Plan Reexamination Report and 2001 Land Use Element of the Master Plan. A specific goal of the plan is "to enhance orderly development of industrial areas by encouraging light industrial uses, by promoting the redevelopment and adaptive re-use of the Township's industrial buildings and sites, and by delineating districts specifically designed to accommodate such uses and related activities that are compatible with the community's overall development pattern." The Township's plans also recognize the need to promote development that takes into consideration and protects environmentally sensitive areas. These policies are consistent with the goals of this District Master Plan. The 2020 District Land Use Plan places existing developed properties in South Hackensack within the Employment Center Planning Area and environmentally-sensitive properties within the Preserve Planning Area.

14. TETERBORO

The Borough of Teterboro adopted the most recent Master Plan Reexamination Report in 2016. As one of the long term, continuous goals, the Borough identified working with the NJSEA to ensure land development regulations adopted by Teterboro for the portions under local planning and zoning jurisdiction is similar to the land development regulations adopted by the NJSEA for the portion of the Borough located within the planning and zoning jurisdiction of the NJSEA. In addition, the Borough has determined that the NJSEA development regulations represent appropriate and reasonable regulatory controls that result in building arrangements and intensities of use that serve the Borough well. Similar to the NJSEA regulations, the Borough would like to reclaim environmentally damaged sites and mitigate impacts on remaining environmental and natural resources.

The 2020 Land Use Plan for the District includes a new designation as a Commercial Center Planning Area for the Teterboro Landing complex, a Neighborhood Planning Area for Vincent Place, Airport Planning Area for Teterboro Airport, Preserve for Teterboro Woods and wetlands on the airport property, and Employment Center Planning Area for the remainder of the Borough. These classifications are complementary to adjoining land uses beyond the District boundaries.

G. MUNICIPALITIES ADJACENT TO THE DISTRICT

1. HASBROUCK HEIGHTS

In its 1994 and 2011 Master Plan Periodic Reexamination, the Borough of Hasbrouck Heights seeks "to provide an orderly and planned program which shall properly regulate commercial development along the Route 17 corridor in a manner which promotes sound planning and a desirable visual environment." Areas along Route 17 are designated as B-2 Highway Commercial Zone, which permits various retail uses such as large stores, hotels, motels, and restaurants. The Borough designates an area adjacent to the District boundary, bisected by

Industrial Avenue and located to the southwest of Anderson Avenue, as Industrial. The District Land Use Plan designates most of the areas adjacent to Route 17 in Teterboro and Moonachie as Airport Planning Area and Employment Center Planning Area.

2. WOOD-RIDGE

The Borough of Wood-Ridge 2016 Master Plan Reexamination Report designates sections of Wood-Ridge adjacent to the District boundary as Light Industrial Park, and a one- and two family neighborhood located to the north. The Light Industrial Park areas about the Neighborhood, Employment Center, and Preserve Planning Areas of the 2020 District Land Use Plan.

3. FAIRVIEW

The 1997 Master Plan and 2005 Master Plan Reexamination Report describes the two small areas of Fairview that share borders with the District:

- The section adjacent to Ridgefield is zoned as a General Business District. A flood hazard and wetland area along Bellman and Wolf Creeks marks the boundary between the two municipalities.
- A section adjacent to North Bergen contains industrial uses.

The 2020 Land Use Plan designates the adjacent areas in the District as Logistics/ Industrial Center.

H. MEADOWLANDS VISION 2040

The Meadowlands Regional Chamber (MRC) has served as the chamber of commerce and a staunch advocate for Meadowlands area businesses for the past 40 years. The NJSEA (previously the NJMC) has a long history of partnership and cooperation with the MRC. The MRC recently completed Meadowlands Vision 2040 - A Roadmap to Economic Success (Vision 2040), a strategic plan for continued economic growth in the Greater Meadowlands region.

Vision 2040 includes 32 communities in the Greater Meadowlands region (including the 14 municipalities in the District), recognizing the economic, population and transportation connections that define the broader North Jersey region.

Vision 2040 identifies broad goals, opportunities and challenges for the region, and it envisions what the Greater Meadowlands can achieve in economic opportunity, job growth, mobility and quality of life. Goals include the following:

1. Promote a diversified economy that capitalizes on the location and assets of the Meadowlands, providing jobs for a range of skill levels in the regional workforce that support the development of new businesses built on innovation and advanced technology as well as the traditional industries of the district.
2. Provide the framework for a balance of complementary land uses that maintains fiscal stability, a high quality of life, and efficient mixed uses that focus density around accessible centers and thus leverage infrastructure investments.
3. Achieve and maintain a healthy estuarine environment in the District, hosting a diversity of terrestrial and aquatic species, protecting critical habitats and remediation of contaminated sites.
4. Support the provision of an efficient, user friendly (parking, bike, pedestrian facilities to transit) network of bus, rail and highway facilities that provide connection within the District and to the metropolitan area, supporting access to jobs, tourism/entertainment, residential and freight movements.

5. Implement a well-maintained system of flood controls protecting existing businesses, neighborhoods and redevelopment/development sites, enabled by an appropriate regulatory framework balancing economic, transportation and environmental concerns.
6. Sustain a region that is attractive, safe and vital for families, youth and seniors, offering educational, recreational and cultural opportunities that enhance the quality of life, and attracting young talent with career opportunities and vibrant places to live.
7. Create an identity for the New Jersey Meadowlands as a unique destination for business, recreation, shopping and entertainment as well as reinforcing its unique economic significance and linkages with New York City and the Northeast region.

These goals align with the vision for the District in this Master Plan update. The NJSEA looks forward to continuing its partnership with the MRC to increase the economic vitality of the District.

I. REGIONAL PLAN ASSOCIATION

The Regional Plan Association (RPA) is a research organization that engages in planning advocacy in the New York-New Jersey-Connecticut metropolitan region. In November 2017, the RPA released its Fourth Regional Plan entitled “Making the Region Work for All of Us.” This plan recognizes the ecological value of the Meadowlands and offers policy recommendations to support environmental preservation and flood control goals, including the establishment of a national park in the Meadowlands to protect its fragile ecosystem and help educate the public about climate change adaptation by promoting a unified identity for the Meadowlands District.

The NJSEA particularly concurs with the RPA plan’s assertion that “properly managed natural landscapes can help mitigate the impacts of climate change.” The NJSEA establishes a path to implement resiliency objectives in [Chapter 9 “Sustainable Meadowlands – a Guide to a Resilient Future for the Hackensack Meadowlands.”](#)

SUSTAINABLE MEADOWLANDS: A GUIDE TO RESILIENCY



9. SUSTAINABLE MEADOWLANDS: A GUIDE TO RESILIENCY

I. THE HACKENSACK MEADOWLANDS DISTRICT

The Hackensack Meadowlands Reclamation and Development Act (N.J.S.A. 13:17-1 et seq.), effective January 13, 1969, recognized the Meadowlands of the Lower Hackensack River as “a land resource of incalculable opportunity for new jobs, homes and recreational sites.” The Act cited “their strategic location in the heart of a vast metropolitan area with urgent needs for more space for industrial, commercial, residential, and public recreational and other uses.”

The objectives of the 1969 Act, which are incorporated into the Hackensack Meadowlands Agency Consolidation Act of 2015 (N.J.S.A. 5:10A-1 et seq.), included:

1. The preservation of the delicate balance of nature;
2. The provision of special protection from air and water pollution and a special provision for solid waste disposal; and
3. The orderly, comprehensive development of the Hackensack Meadowlands in order to provide more space for industrial, commercial, residential, public recreational, and other uses.

The Hackensack Meadowlands Development Commission (HMDC), as predecessor to the New Jersey Sports and Exposition Authority (NJSEA), was established by the Act to facilitate the cleanup and enhancement of the environment and promote appropriate development. Since the inception of the Act, more than 3,500 acres of wetlands have been preserved and enhanced, leading to an environmental and wildlife renaissance. At the same time, billions of dollars in economic development in the past five decades have been realized through planning that is sensitive to the environment.

The concept of resiliency has come to the forefront in the wake of Superstorm Sandy in 2012. However, the NJSEA has long made the region more resilient through enforcement of its regulations, which



effectuate provisions of its Master Plan, and its work over the past five decades. The agency has a long history of adapting to changing circumstances and will continue to do so as climate change and sea level rise threaten both the natural and built environment of the District.

Planning for resiliency cannot be conducted in isolation. The creators of this agency with its District

oversight recognized that the three principal NJSEA mandates of environmental preservation, economic development, and solid waste disposal are interrelated and need to be addressed in unison in order to be successful. These seemingly competing policy objectives have been successfully balanced by the agency over the past 50 years, with a demonstrated track record of remarkable achievements across all three sectors.

II. NJSEA RESILIENCY AND STEWARDSHIP EFFORTS

Highlights of the NJSEA's ongoing resiliency and environmental stewardship efforts include the following:

1. Coastal Zone Management;
2. NJSEA Regulations;
3. Floodplain Management Initiatives;
4. Community Rating System;
5. Collection and Assessment of Flooding Incidents;
6. Drainage System Inspections;
7. Municipal Equipment Pool;
8. Monitoring Water Levels in the District;
9. Wetland Preservation, Mitigation, and Restoration;
10. NJSEA Natural Resources Management Department;
11. Meadowlands Environmental Research Institute;
12. Meadowlands Environment Center; and
13. Regional Stakeholder Coordination.

A. COASTAL ZONE MANAGEMENT

The District Master Plan serves as an element of the State of New Jersey's Coastal Management Program (CMP) for areas within the Hackensack Meadowlands District (District). Pursuant to State Coastal Zone Management (CZM) rules, the NJSEA is the lead planning and management agency within the District, a coast wide special area, and coastal activity or development in the District must be consistent with the District's Master Plan. The New Jersey Department of Environmental Protection (NJDEP) and the NJSEA coordinate the review of proposed development and other activities within the District, through the process outlined in N.J.A.C. 7:7-9.43 and a Memorandum of Agreement between the two agencies dated November 9, 2005. As such, the NJSEA professional staff provides CZM recommendations to the NJDEP for in-District applications, as necessary.

B. NJSEA REGULATIONS

The District Master Plan and corresponding zoning regulations direct development to zones within appropriate upland areas, including brownfields and redevelopment areas. Within those zones, open space and coverage regulations balance the intensity of development on a site, and requirements for waterway buffers provide for protection of natural areas along waterways and tributaries. Vertical development is not permitted on properties within the Environmental Conservation zone.

The District zoning regulations also require the preparation of a Project Impact Assessment (PIA) to evaluate impacts of new development with respect to the environment, fiscal, emergency services, municipal services, schools, and transportation.

District zoning regulations set forth elevation and flood proofing requirements for new buildings, additions, and other structures within designated Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (SFHAs) within the District. The lowest floor elevation is determined by the most restrictive of the following: base flood elevation plus one foot (BFE+1) as published in the approved FEMA Flood Insurance Study/Flood Insurance Rate Map (FIRM) referenced in the District Floodplain Management Regulations at N.J.A.C. 19:4-9.1 et seq; the best available flood hazard data elevation plus one foot; or as required by ASCE/SEI 24-14 entitled, Flood Resistant Design and Construction. Floodplain development requires the submission of an elevation certificate to certify compliance with these requirements.

C. FLOODPLAIN MANAGEMENT INITIATIVES

Given the unique environmental challenges associated with the low-lying lands of the District, stormwater management is a key consideration with every development application. All development applications are reviewed for conformance with NJSEA stormwater drainage requirements at N.J.A.C. 19:4-8.6, and, as a significant portion of the District lies within FEMA's SFHA, the NJSEA professional staff reviews all development applications for conformance with the District Floodplain Management Regulations. In addition, the District zoning regulations require the submission of an Operations and Maintenance (O & M) Manual for all approved stormwater drainage systems to ensure that systems remain operational.

D. COMMUNITY RATING SYSTEM

Since 1992, the NJSEA has participated in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS), which is a voluntary program that affords a discount on flood insurance premium rates for property owners, including businesses, tenants, and residents located in a SFHA in the District. It is a point-based system that accumulates credits for certain activities related to flooding mitigation while providing progressively larger discounts on the premium rates. The NJSEA's participation in the CRS program for the 2016 five-year cycle application, maintains the classification of the Meadowlands District as a CRS Class 7 Community, resulting in a 15 percent discount on NFIP policies issued through FEMA.

In order to qualify for the discount, the NJSEA must continue to implement certain activities that meet or exceed the point system established as part of the CRS. The NJSEA has been recognized by FEMA for its actions in areas including flood data maintenance, open space preservation, stormwater management standards, and drainage system maintenance. As part of the CRS program, the District regulations require floodproof development through the elevation of new construction and substantial improvements above the Base Flood Elevation (BFE) established by FEMA Flood Insurance Rate Maps (FIRMs).

Besides the benefit of reduced flood insurance rates, CRS-sanctioned floodplain management activities may enhance public safety, reduce potential damages to property and public infrastructure, avoid economic disruption and losses, reduce human suffering, and protect the environment. Participating in the CRS incentivizes actions performed under a community's floodplain management program in an effort to lessen losses due to floods. The CRS requires annual recertification between the required five-year cycle applications to maintain the discount.

NJSEA's participation in the CRS program also requires the development of a floodplain management plan. The Hackensack Meadowlands Floodplain Management Plan (FMP), adopted in 2005, was

developed in cooperation with NJSEA municipalities, county governments, and other stakeholders. The FMP acts as a guide for the NJSEA to implement FEMA policies, and includes floodplain management initiatives and mitigation strategies within the District. The FMP is currently being updated to be included in the CRS five-year cycle application in 2021.



E. COLLECTION AND ASSESSMENT OF FLOODING INCIDENTS

The NJSEA continues to actively collect, log, and assess flooding complaints on individual properties, including inspecting the District for flood impacts following severe storms. NJSEA professional engineers are available to meet with property owners for on-site inspections and to discuss site-specific stormwater drainage options.



F. DRAINAGE SYSTEM INSPECTIONS

NJSEA's participation in the FEMA CRS program requires annual inspections of stormwater infrastructure by NJSEA engineering staff. In addition, the NJSEA regularly evaluates the functionality of all tide gates and pump stations within the District. Since much of the District is tidally impacted, routine inspection of tide gates and pump stations is important to identify issues that could impact flooding in upstream areas. The NJSEA inspects tide gates at various tide conditions in order to accurately identify problems and maintenance that may be required. Pump stations are inspected with the respective municipal or county Department of Public Works (DPW) to ensure each system is operating properly. Additionally, waterways and ditches are inspected throughout the District to ensure adequate stormwater conveyance capacity. The NJSEA coordinates with municipalities and counties for removal of stream debris and tide gate repairs. These inspections and maintenance activities have helped to lessen the damaging effects of several major storms.

G. MUNICIPAL EQUIPMENT POOL

The maintenance of storm sewer systems is critical to ensure adequate stormwater carrying capacity. The NJSEA provides and maintains equipment for use by municipal workers to assist municipalities in the District with maintenance issues that, if neglected, could exacerbate flooding. A jet vac-truck, root cutter, portable automatic self-priming pump systems, and trailer-mounted light tower are available to municipalities free of charge to encourage ongoing maintenance of storm sewer systems.

H. MONITORING WATER LEVELS IN THE DISTRICT

The NJSEA, in conjunction with MERI, continuously monitors water levels in the District via state-of-the-art data collection instruments stationed at tide gates, in the marshes, and in the Hackensack River, including a total of 17 water level sensors. MERI and the NJSEA also maintain, update, and upgrade the monitoring equipment as needed. Data collected from the monitoring stations are relayed to the NJSEA/MERI via 4GLTE telemetry. The information gathered is relayed to international servers to ensure that data is available to the public in real time, even during power outages in the Meadowlands area. This ensures that timely warning can be provided to first-responders and residents when water levels rise during tidal events, heavy rains, and storms.



The active monitoring of water levels allows municipalities and the general public to be alerted of potential flooding events through MERI's Real-Time Water Level Alert System. The general public can subscribe to receive email and text-based early warning flood alerts through the MERI website (<http://meri.njmeadowlands.gov>). These alerts are provided when water levels reach elevation 5.5 feet (NAVD88) and continue to be relayed as the levels rise. The NJSEA and MERI also provide a series of detailed flood maps for the District's constituent municipalities, showing which streets and properties would be flooded by a tidal surge of four to eight feet, depicted at one-foot intervals.

I. WETLAND PRESERVATION, MITIGATION, AND RESTORATION

The NJSEA has been working to preserve and restore wetlands for decades in an ongoing effort to promote resiliency and habitat protection. In order to maintain natural buffer areas between the Hackensack River watershed and developed areas, the NJSEA continues to acquire critical tracts of wetlands. An additional benefit to such wetland preservation within the floodplains of the Hackensack River is the increased area of wetlands and marshes available to help dissipate the effects of storm events, tidal flows, and sea level rise. According to the US EPA, an acre of wetland can store between 1 and 1.5 million gallons of floodwater. Every remaining parcel of wetlands in the District, in many cases inclusive of adjoining upland areas, incontrovertibly contains value, not only for wildlife habitat, but also for their functionality to accommodate floodwater storage and projected marsh migration. To date, approximately 3,500 acres of wetlands have been preserved and/or restored, three-quarters of which are owned by the NJSEA or the Meadowlands Conservation Trust (MCT), providing significant floodwater storage capacity and habitat protection.

The Meadowlands Conservation Trust Act of 1999 (N.J.S.A. 13:17-87) led to the creation of the MCT, a New Jersey State agency that is in, but not of, the NJSEA. The MCT was formed to acquire and preserve environmentally sensitive land and to enhance the environment of the District and the Hackensack River watershed. The NJSEA provides administrative and technical support to the MCT.

Nearly 1,000 acres of sensitive lands are preserved and managed by MCT, including the 16-acre Skeetkill Creek Marsh Park in Ridgefield, which was donated to the MCT by the New Jersey Meadowlands Commission (NJMC), predecessor to the NJSEA, in 2008, and the 587-acre Richard P. Kane Natural Area (Kane Tract) in Carlstadt and South Hackensack, which was acquired by the MCT in 2005. The MCT also owns and/or manages a number of other environmentally sensitive properties outside the District boundaries.

A mitigation bank was created by the MCT on a 217-acre portion of the Kane Tract, which was designed to establish and maintain aquatic resource habitat through the enhancement of tidal marshes, channels, and mudflats, and the restoration of 0.68 acres of tidal wetlands. Total vegetation coverage has increased on this site from 27 percent in 2014 to 86 percent in 2017.

The District is home to a large number of private and public wetland mitigation projects that were associated with development projects that resulted in wetlands impacts. Most of these projects include actual enhancement, while some only include simple preservation of wetlands (see [Chapter 5 – Environment](#), Figure 5.2 “Wetland Restoration, Mitigation, and Preservation Sites in the Meadowlands District”). The mitigation ratios required for wetlands fill permits issued by the USACE typically vary between 3:1 for enhancement, and 27:1 for preservation. Mitigation ratios are used by regulators to adjust the number of acres gained and lost as a result of mitigation trades. The different ratios reflect the differing quality of the wetlands to be enhanced or preserved. The ratio is calculated as the number of acres to be enhanced or preserved for each acre of wetland impacts. Enhancement projects are also paired with the type of wetland impact, and can vary from forested freshwater wetland to brackish emergent marsh.

J. SUSTAINABILITY INITIATIVES

The NJSEA has been at the forefront in promoting sustainability initiatives that aim to reduce greenhouse gas emissions in the District.

The District zoning regulations encourage the use of clean, renewable and/or sustainable energy, such as energy generated by photovoltaic, wind energy, hydropower, and geothermal installations, and provide flexible zoning requirements for such installations, including reduced setback requirements for ground-mounted photovoltaic structures and a reduction in fees for projects including sustainable energy components.

Since 2006, the NJSEA has approved approximately 50,000 kW of solar projects in the District, inclusive of 3,154 kW of solar installations on NJSEA-owned properties, comprised of a 3,000 kW ballasted solar installation on the NJSEA’s 1-A Landfill in Kearny (the largest photovoltaic installation in the District), a 121 kW solar carport at the NJSEA’s administrative offices in Lyndhurst, and a 33.3-kW photovoltaic rooftop installation at the NJSEA’s Center for Environmental and Scientific Education (CESC). The CESC is the first public building in the State of New Jersey to achieve the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Platinum certification.

LEED is a Green Building Rating System developed by the United States Green Building Council (USGBC) as a standard for developing high-performance, sustainable buildings. The District zoning regulations encourage sustainable green building practices through the provision of incentives based on achievement of LEED certification. Incentives range from reductions to required zoning fees and priority review of applications, to density bonuses where residential units are permitted.

The NJSEA’s Meadowlands Adaptive Signal System for Traffic Reduction (MASSTR), an intelligent transportation system that utilizes adaptive traffic signal control software, wireless and fiber-optic communications, and vehicle detection devices to optimize traffic flow through the region, has resulted in reduced vehicle delays, which corresponds to reductions in gasoline consumption and greenhouse gas emissions that contribute to climate change.

K. PRIVATE SECTOR CONFIDENCE

Despite the prevalence of low-lying floodplains in the District, businesses continue to invest in the Meadowlands region, as the District is strategically located in the NJ/NY metropolitan region, only five miles west of New York City, within a robust multimodal transportation network.

As a result of the desirability of development sites and tenant spaces in the District, properties within

the District continue to experience strong demand and high occupancy rates, as evidenced by the NJSEA's receipt of over 500 land use applications annually. The NJSEA's land use policies direct the accommodation of this demand to suitable upland sites and brownfields in order to alleviate development pressure on environmentally sensitive wetlands. Private projects aimed at improving the resiliency of District properties, such as floodproofing structures and wetland enhancement, indicate that the private sector believes the District is worthy of high levels of investment.

L. NJSEA NATURAL RESOURCES MANAGEMENT DEPARTMENT

The NJSEA Natural Resources Management Department supports improvements to the District's unique urban ecosystem through numerous surveys and studies of the region's flora, fauna, and wetlands to help guide protection and restoration of the environment within the Hackensack Meadowlands watershed.



The NJSEA's fishery resource inventory reports and avian studies performed over the past 30 years, discussed in [Chapter 5 – Environment](#), have shown a marked increase in the number and types of species inhabiting the District year-round and during migratory season, providing evidence that the Hackensack River's water quality has greatly improved. Current research in progress includes studies of avian high marsh breeding habitats and diamondback terrapins.

M. MEADOWLANDS ENVIRONMENTAL RESEARCH INSTITUTE

The NJSEA headquarters houses the Meadowlands Environmental Research Institute (MERI), which was formed in 1998 and is operated through a partnership with Rutgers University. MERI is a premier institution whose scientists perform critical scientific studies that have helped the NJSEA to better understand, manage, and improve the Hackensack River, its wetlands, and the District's unique urban ecosystem.

MERI maintains a clearinghouse of data that is utilized by the NJSEA, including in support of this Master Plan update. Recent MERI work includes studies on carbon sequestration in wetlands,



benthic organisms, and sediment accretion; real time water and air quality monitoring and analysis in the MERI Laboratory; the utilization of drones for environmental monitoring, inclusive of wetlands and stormwater structures, tide gates and berms; real time tide gate monitoring, with results published and distributed to the public; and studies regarding flooding and its corollary impacts. In addition, MERI creates, maintains, and updates web-based digital maps and mapping tools for every property within the entirety of each constituent District municipality.

N. MEADOWLANDS ENVIRONMENT CENTER

The Meadowlands Environment Center (MEC), which is operated through a partnership with Ramapo College of New Jersey, offers school programs for students in Grades K-12 to raise awareness of the importance of environmental conservation and protection at an early age. MEC educators incorporate hands-on and inquiry learning and cross-curricular activities that use DeKorte Park as an outdoor classroom. The MEC is a leader in developing and expanding comprehensive environmental education programs for all ages. MEC classes meet Next Generation Science Standards (NGSS) and NJ Core Curriculum standards that promote STEM (Science, Technology, Engineering and Math) education. In 2018, more than 20,000 students from 81 school districts in New Jersey participated in MEC programs.

O. REGIONAL STAKEHOLDER COORDINATION

The NJSEA staff regularly coordinates with various federal, state, regional and local agencies, including the U.S. Army Corps of Engineers, the NJDEP, the Bergen and Hudson-Essex-Passaic Soil Conservation Districts, the Port Authority of New York and New Jersey (PANY&NJ), Bergen and Hudson Counties, constituent and neighboring municipalities, and various utilities and municipal utility authorities.

The NJSEA works with the Meadowlands Interagency Review Team (IRT, formerly known as the Meadowlands Interagency Mitigation Advisory Committee, or MIMAC), the federal and state advisory board, with respect to all wetland impacts in the District. Federal and state permit applicants must satisfy an alternatives analysis proving that no upland alternative exists to a proposed wetland impact. The IRT includes representatives of the US Army Corps of Engineers (USACE), NJDEP, NJSEA, USEPA, US Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration (NOAA) Fisheries, also known as the National Marine Fisheries Service.

Applicants' proposals typically target the enhancement of emergent low marsh (which is inundated twice daily), as opposed to high marsh (which is inundated infrequently), because high marsh is more likely to be overtaken by nuisance species such as *Phragmites australis*, the common reed. However, in light of sea level rise and climate change, the IRT also requires applicants to consider high marsh and future marsh migration.

The NJSEA is also required by state law to coordinate with the NJDEP Bureau of Tidelands Management with respect to tidelands instruments (grants, licenses and leases) required to release State's riparian interest for formerly flowed tidelands located within the District. Prior to a final decision by the Tidelands Resource Council, tidelands matters in the District require receipt of a recommendation from the NJSEA Board of Commissioners, in coordination with the NJDEP staff at the Bureau of Tidelands Management.

FLOODING IN THE MEADOWLANDS

The Meadowlands region has a long history of flooding. Beginning as early as the late 1600's, farmers began finding ways to remove water from the wetlands in this area. The digging of ditches and canals began in earnest in the early 1900's by the area's Mosquito Commissions, which were charged with the responsibility of preventing standing water as a mosquito control strategy. This effort resulted in the development of a complicated network of "legacy" berms, canals and ditches that, to a limited degree, continued to serve as flood control structures. The berms and flood control structures such as tide gates in the District are located on both private and public (state, county, NJSEA, and municipal) properties. Ownership and responsibility for the maintenance of berms and tide gates varies accordingly and can be difficult to establish.

The NJSEA also coordinates with other entities having interest in regional resilience, including the Meadowlands Regional Chamber of Commerce, the Hackensack Riverkeeper, NY/NJ Baykeeper, NJ Audubon, and other environmental advocacy groups, as well as utilities such as PSE&G and Williams Transco.

III. SUPERSTORM SANDY

Superstorm Sandy (Sandy) came ashore as an immense tropical storm in Brigantine, New Jersey, on October 29, 2012. Although rainfall was limited to less than 2 inches within Bergen County, wind gusts were recorded at up to 76 mph. A full moon made the high tides 20 percent higher than normal and amplified the tidal storm surge. Sandy wreaked havoc on Bergen and Hudson Counties with surges that registered approximately 4 to 5 feet above average high tide. [Map 17 - Superstorm Sandy Inundation \(2012\)](#) shows water elevation levels and storm surge depths as recorded by the MERI sensor at the Barge Club Marina monitoring station in the Hackensack River in Carlstadt. Coastal communities in New Jersey sustained significant damage and there was wide-spread destruction as a result of the storm. Although protected from severe waves, the Bergen County shoreline within the Hudson-Raritan Estuary experienced record storm surge elevations propelled by Sandy's strong winds. Hudson County municipalities in the District also experienced flooding from the tidal surge. Some 2.7 million households within New Jersey lost power. Sandy was estimated to have cost the State of New Jersey over \$36 billion.

MERI maintains sensors at 17 monitoring stations throughout the District that have continuously monitored the region's air, soils and water for more than 15 years. The data, collected in real-time, includes measurements of water levels along the Hackensack River and its marshes, as well as the concentration of fresh and salt water and turbidity. During Sandy, the unprecedented sea surge overtopped all flood control structures, riverbanks, creek banks and berms in the Meadowlands District. MERI lost important field monitoring equipment during the storm; however, three sensors, located at River Barge Park in Carlstadt, East Riser Tide Gate in Berry's Creek, and the Moonachie Tide Gate located in marsh land along the Hackensack River near Exit 18W of the New Jersey Turnpike remained operational. These sensors collected invaluable data that tells the story of Sandy in the Meadowlands District. The NJSEA believes this to be the only monitoring data collected during Sandy within the Meadowlands.

While the sea surge's full force hit shortly after midnight on October 30, it had been building for at least 10 hours beforehand, according to MERI's measurements. On October 29 at 2:00 p.m., the average low tide measured in the District was elevation 3 feet (NAVD88), which is equivalent to an average high tide. As noted previously, the Hackensack River is tidally influenced and is thus impacted by both the ocean's tides and rainfall events. Shortly before 6:30 p.m., MERI sensors measured the water level in the Hackensack River at above elevation 5 feet (NAVD88) and rising. At 8:00 p.m., the NOAA monitoring station at Sandy Hook was seriously damaged and ceased to transmit water levels, making it increasingly difficult to predict and communicate the storm's path. At about the same time that NOAA lost its monitoring equipment, the sea surge began to rapidly increase in strength, bolstered by unrelenting winds of 60 to 80 miles per hour.

The surge lasted six hours, from approximately 8:00 p.m. on October 29 to approximately 2:00 a.m. on October 30. During this time, MERI recorded average water level elevations of 8.6 feet (NAVD88) at River Barge Park Marina and 9.5 feet (NAVD88) at the Moonachie Creek tide gate, with periodic tidal surges measuring well above 10 feet. The water rushing in from the Atlantic Ocean was so high that it overtopped

the New Jersey Turnpike, which stands at elevation 10 to 11 feet (NAVD88), from approximately north of Exit 15W in Kearny to just north of Exit 18W in Carlstadt. The eight-foot storm surge inundated the majority of land in the District.

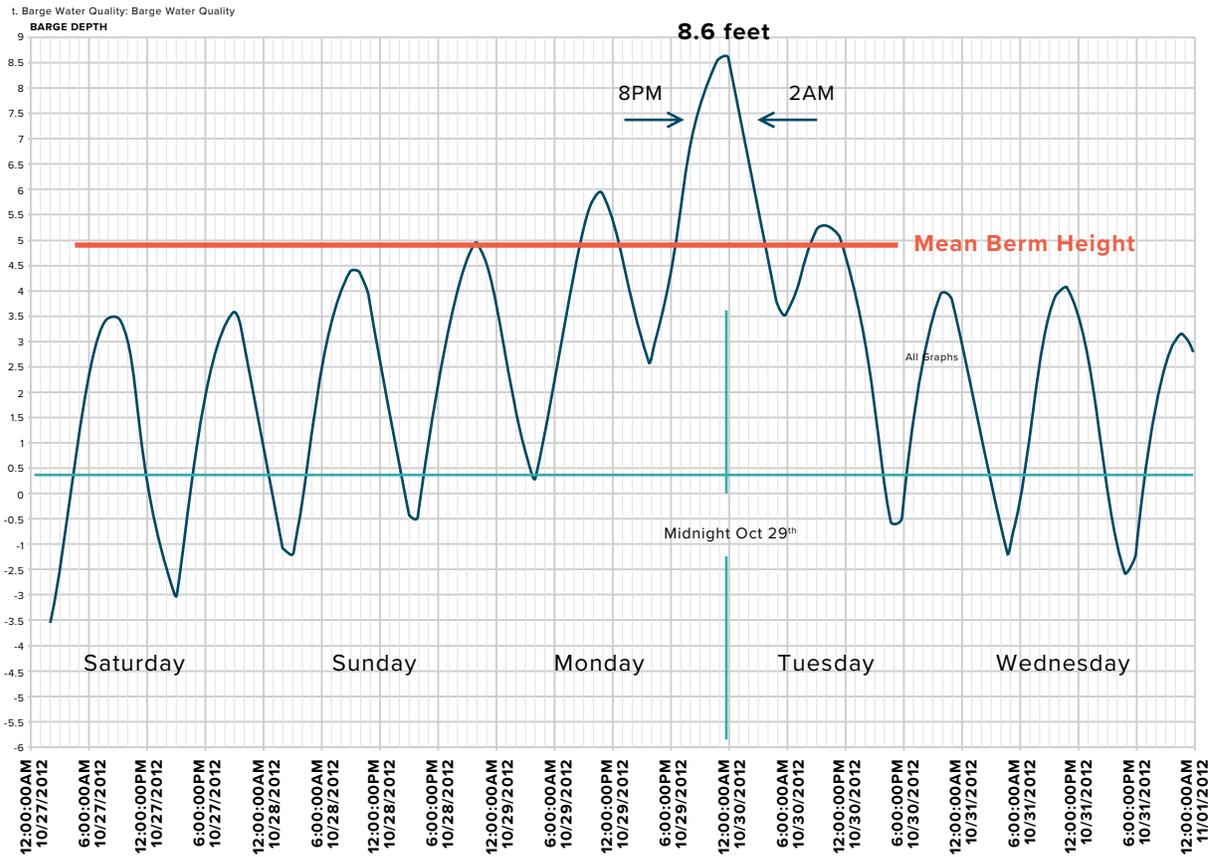
MERI's data further showed that the salinity levels in the Hackensack River almost doubled during the storm, confirming that it was ocean water that caused the Hackensack River to overflow its banks. Turbidity levels, which measure the result of turbulence in the water column on the Hackensack River, were also extremely elevated.

Superstorm Sandy resulted in a churning sea roiling extremely fast through Newark Bay, up the Hackensack River and ultimately into the Meadowlands, where many of the businesses and residential areas along the River are built on land as low as approximately elevation 3 feet (NAVD88). These areas are protected by a 28-mile system of berms (the naturally occurring or manmade mounds or walls of earth or sand) and 29 tide gates and pump stations (structures that prevent tidal water from moving upstream while allowing streams and creeks to flow downstream) that provide flood protection in the range of elevation 5 to 5.7 feet (NAVD88). During Sandy, these flood control structures were overtopped and/or breached by the storm's surging floodwaters. (See Figure 9.1 "Water Levels at Carlstadt River Barge Park Marina during Superstorm Sandy.") While it is not unheard of for berms in the District to be overtopped during high intensity storms, the severity and extent of flooding during Sandy could be considered a warning of future occurrences as climate change results in sea level rise.



Figure 9.1

WATER LEVELS AT CARLSTADT RIVER BARGE PARK MARINA DURING SUPERSTORM SANDY



SOURCE: MERI

A. POST-SANDY MAPPING CHANGES

In the months after Sandy, FEMA released Preliminary FIRMs to reflect the most up-to-date scientific data relating to the likelihood of flooding resulting from the 100-year base flood, which is a flood having a one percent chance of being equaled or exceeded in any given year. While revised FIRMs were under development by FEMA prior to Sandy, the extreme events of October 2012 resulted in recognition that the BFE shown on the then-effective FIRMs did not adequately reflect current coastal flood hazard risks. The resulting Preliminary BFE for the areas within Moonachie, Little Ferry, and Carlstadt that sustained among the greatest impacts from the flooding during Sandy is listed as 8 feet (NAVD88).

District zoning regulations require that the minimum lowest floor elevations for structures within the designated 100-year flood zones are established one foot above the applicable 100-year base flood elevations determined by FEMA's FIRM maps. By adhering to rebuilding standards using the more restrictive of either the effective FEMA FIRM maps plus one foot, FEMA's best available flood hazard data (currently the Preliminary FIRM maps) plus one foot, or American Society of Civil Engineers (ASCE) "Flood Resistant Design and Construction," ASCE/SEI 24-14, Table 6-1 (deemed by FEMA to meet or exceed the minimum NFIP requirements for buildings and structures), the NJSEA provides an additional level of flooding protection for future development in the District to help protect District residents, tenants, and property owners from the damaging impacts of flooding.

Most low-lying properties within the floodplain that sustained major damage as a result of Superstorm Sandy in 2012 were constructed prior to the creation of the 1969 Act and its corresponding zoning regulations. Prior to 2012, there were less than 10 repetitive loss properties within the District. The number of repetitive loss properties in the District has increased to 119 post-Sandy.

B. POST-SANDY RESILIENCY INITIATIVES

1. REBUILD BY DESIGN MEADOWLANDS (RBDM)

In the summer of 2013, the United States Department of Housing and Urban Development (HUD) launched the Rebuild by Design (RBD) competition to develop ideas to improve resilience in regions affected by Superstorm Sandy. The competition sought to develop flexible solutions that would increase regional resilience. On June, 2, 2014, HUD announced that a design concept for the Meadowlands region near the Boroughs of Little Ferry, Teterboro, Moonachie, South Hackensack, and Carlstadt was selected as a winner of HUD's Rebuild by Design competition. To fund this project, HUD allocated \$150 million towards the design and construction of a solution that will reduce flooding risks and enhance resiliency in this area.

The Project Area is bounded by the Hackensack River to the east; the southern boundary of the Borough of Carlstadt along Paterson Plank Road (State Route 120) to the south; State Route 17 to the west; and Interstate 80 (I-80) and the northern boundary of the Borough of Little Ferry to the north. In total, the Project Area encompasses approximately 5,405 acres, the majority of which is located within the Meadowlands District.

The Project Area is vulnerable to both coastal flooding from storm surges and systemic inland and riverine flooding from large rainfall events. Coastal flooding results from high tides that are higher than normal high tides (such as storm surges) and can be worsened by onshore winds. Sandy most recently exposed the vulnerability of the Project Area to coastal flooding after low-lying areas were inundated by coastal storm surges. However, within the Project Area, inland flooding, which occurs during high-intensity rainfall/runoff events, is more common and happens more frequently than coastal flooding. These events can include moderate precipitation accumulating over several days, heavy precipitation falling over a short time period, or other circumstances in which ditches, creeks, or rivers overflow as a result of rainfall. Furthermore,

the Project Area's existing vulnerabilities to flooding may worsen over time due to the effects of climate change and sea level rise.

Due to the Federal funding involved, the multi-year study was subject to the National Environmental Policy Act (NEPA), which required that an Environmental Impact Statement (EIS) be prepared. Both a Draft and Final EIS were prepared to analyze the potential effects on



PHOTO COURTESY OF M.E. RAINE

the physical, natural, cultural, and socioeconomic environment from the proposed Federal action. Following the completion of the EIS public process, a final EIS was prepared.

The Record of Decision (ROD) published in December 2018 identified Alternative 3 (Build Plan and Future Plan) as the selected alternative and, ultimately, the Alternative 3 Build Plan as the Project that will be implemented with the \$150 million in allocated HUD funds. Construction is scheduled to begin in 2020 or early 2021. The Alternative 3 Build Plan consists of the following components:

- A new pump station and new force main along Losen Slote in Little Ferry;
- Dredging of Lower East Riser Ditch between the existing tide gate and Moonachie Avenue, with a new pump station installed at the tide gate;
- A system of 41 green infrastructure installations (bioswales, storage trenches, and rain gardens) along various roadways in the Project Area; and
- Three new parks (comprising approximately 7.6 acres in total) and improvements to five existing open spaces/public amenities.

The Alternative 3 Future Plan includes the remaining features identified in the ROD ⁱⁱ that could be constructed over time by others as funding sources become available and construction feasibility permits.

HUD requires the development and implementation of an Operations and Maintenance (O&M) Plan for all federally-funded components of the RBDM Project. The O&M Plan will address all requirements necessary to operate and maintain the RBDM Project, train personnel, test equipment, and schedule periodic and post-event inspections and repair work in a timely manner to maximize long-term reliability of the flood risk management measures.

2. NATIONAL DISASTER RESILIENCE GRANT COMPETITION

HUD's National Disaster Resilience Grant Competition awarded \$1 billion in federal funding to eligible communities for disaster recovery and resilience planning, of which the State of New Jersey received a \$15 million grant in January 2016. Coastal and riverine flooding and other stormwater challenges do not recognize municipal boundaries; they are regional in nature and require corresponding regional solutions. A portion of the HUD funds is being used by the NJDEP to develop a grant program to develop and implement plans to address coastal and riverine flooding.

The NJDEP, in collaboration with local jurisdictions, has also been tasked with developing a Regional Stormwater Infrastructure Toolkit of best practices for managing regional stormwater infrastructure. The first two modules of the toolkit will focus on operations and maintenance (O&M) and jobs training tools. Five municipalities within the Meadowlands region of Bergen County: Carlstadt, Moonachie, South Hackensack, Teterboro, and Little Ferry, were chosen as the pilot area, as the region is prone to chronic flooding from both tidal storm surges and rainfall events. The area is vulnerable to the effects of sea level rise and faces significant unmet stormwater control and drainage needs.

The National Disaster Resilience Grant Competition and the concurrent Meadowlands Rebuild by Design project will result in construction of new stormwater infrastructure in the project area, which will require a multijurisdictional approach to operations and maintenance.

IV. SEA LEVEL RISE

New Jersey's climate is changing. Over the last century, New Jersey experienced rising temperatures, increased rainfall, more frequent extreme weather events, and rising sea levels. ⁱⁱⁱ Increases in local sea level are the result of a combination of global, regional, and local changes. These changes are the result of increasing greenhouse gases in the atmosphere due to human activities, such as the burning of fossil fuels, agriculture, and land clearing. At the global scale, sea level is rising. Measured at tide gauges on every continent and by satellites in orbit, global average sea level has risen approximately seven to eight inches since 1900, with about three of those inches occurring since 1993. ^{iv} The observed global increase is the result of several factors, including the melting of glaciers, ice caps and ice sheets; the thermal expansion of ocean water as it warms; and changes in land water storage. In some regions of the world, land is rising faster than sea level, and the rate of local sea level rise is slowing as a result. In other regions, where land is subsiding, local sea level is increasing faster than the global average.

In New Jersey and the northeastern United States, sea level rise rates are increasing faster than the global average. In Atlantic City, sea level has risen by an average rate of 1.5 inches per decade, which is approximately double the global rate. ^v Sea level rise rates in New Jersey are increased by land subsidence associated with natural sediment compaction and groundwater withdrawal. ^{vi}

In response to a stakeholder engagement process between 2012 and 2014, Rutgers University, on behalf of the New Jersey Climate Adaptation Alliance, convened a Science and Technical Advisory Panel (STAP) to help identify alternatives for practitioners to enhance New Jersey's resilience to regional sea level rise, coastal storms, and flood risk. ^{vii} The STAP's goal is to identify and evaluate current science on sea level rise and to provide useful, practical options for public and private sector practitioners. The findings of the STAP panel are described herein.

A. SEA LEVEL RISE MAGNITUDE AND RATE

The magnitude of sea level rise is the amount of rise that is projected. The STAP released a report in 2016 entitled, "Assessing New Jersey's Exposure to Sea-Level Rise and Coastal Storms: Report of the New Jersey Climate Adaptation Alliance Science and Technical Advisory Panel," (STAP Report), which presented a range of estimates of sea level rise (SLR) magnitude for New Jersey, as well as the probability of those



estimates occurring. Figure 9.2 "Sea Live Rise (SLR) Projections for New Jersey" summarizes two of these estimates, measured in feet. The central estimate is a 50 percent probability, and the likely range is a 67 percent probability. Two greenhouse gas emissions scenarios are presented in this table as well. A high emissions scenario is anticipated to accelerate climate change, and thus, speed the rate of sea level rise.

Figure 9.1

WATER LEVELS AT CARLSTADT RIVER BARGE PARK MARINA DURING SUPERSTORM SANDY

YEAR	CENTRAL ESTIMATE	LIKELY RANGE
	50% PROBABILITY SLR MEETS OR EXCEEDS:	67% PROBABILITY SLR IS BETWEEN:
2030	0.8 ft.	0.6 – 1.0 ft.
2050	1.4 ft.	1.0 – 1.8 ft.
2100 Low emissions	2.3 ft.	1.7 – 3.1 ft.
2100 High emissions	3.4 ft.	2.4 – 4.5 ft.

SOURCE: ASSESSING NEW JERSEY'S EXPOSURE TO SEA-LEVEL RISE AND COASTAL STORMS; REPORT OF THE NEW JERSEY CLIMATE ADAPTATION ALLIANCE SCIENCE AND TECHNICAL ADVISORY PANEL (STAP REPORT), 2016. ESTIMATES ARE BASED ON (KOPP ET AL., 2014)

Map 18 - Inundation Footprint in 2050 – 2 ft Sea Level Rise Projection and **Map 19 - Inundation Footprint in 2100 – 3 ft Sea Level Rise Projection** detail the projected inundation footprint in the District in 2050 and 2100 at a potential 2-foot and 3-foot sea level rise, which are the projections at the upper end of the likely scenario in Figure 9.1 above. The color gradient reflects the level of projected inundation and is based on land elevation.

The rate of sea level rise involves the timing of the sea level rise, or when a certain level may be reached. This can have a critical impact not only on developed areas, but on wetlands and their ability to adapt to the changes in sea level. This ability to adapt to SLR is dependent upon other local factors, including sediment accretion and organic matter accumulation from plant production. ^{viii} The STAP Report identified a possible 0.2 to 0.4 inch rise per year between 2010 and 2030. After 2030, the rate of change will depend on future greenhouse gas emissions.

Figure 9.3 “Probability that Sea Level Rise at Atlantic City Will Meet or Exceed Stated Values in Stated Years,” shows potential timing for a range of projected sea level rise, per the STAP Report. All heights have been established with respect to a 1991 to 2009 baseline. Differences between SLR projections under low and high emissions scenarios are small before 2050; projections after 2050 vary greatly depending upon the level of greenhouse gas emissions.

The STAP Report SLR estimates are consistent with those projected by New York State, which were adopted by the New York State Department of Conservation in 2017, as well as the 2012 data developed by a working group that included NOAA, USACE, the United States Geological Survey (USGS), and other agency and academic partners.

With the projected change in sea level, the impacts of future coastal storms in New Jersey will be magnified. Storm surge combined with higher water levels due to sea level rise will make severe coastal flooding more frequent in the future. ^{ix} Tidally-influenced areas like the Meadowlands are also likely to experience increased nuisance, or high tide flooding, in low-lying areas. This type of flooding, which is common in certain Meadowlands communities, occurs even in the absence of severe storms.

Figure 9.3 PROBABILITY THAT SEA LEVEL RISE AT ATLANTIC CITY WILL MEET OR EXCEED STATED VALUES IN STATED YEARS

HIGH EMISSIONS										
	1 FT.	2 FT.	3 FT.	4 FT.	5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
2020	0.1%									
2030	14%									
2040	60%	0.1%								
2050	86%	6%	0.1%							
2060	95%	33%	1%	0.1%						
2070	98%	62%	10%	0.7%	0.1%					
2080	99%	79%	29%	4%	0.5%	0.2%	0.1%			
2090	99%	88%	50%	15%	3%	0.6%	0.2%	0.1%	0.1%	
2100	99%	92%	66%	30%	8%	2%	0.7%	0.3%	0.2%	0.1%

LOW EMISSIONS										
	1 FT.	2 FT.	3 FT.	4 FT.	5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
2020	0.1%									
2030	12%									
2040	52%	0.1%								
2050	78%	3%	0.1%							
2060	89%	14%	0.4%	0.1%						
2070	94%	31%	2%	0.2%	0.1%					
2080	96%	46%	5%	0.7%	0.2%	0.1%				
2090	97%	59%	12%	2%	0.5%	0.2%	0.1%	0.1%		
2100	97%	69%	20%	4%	1%	0.5%	0.2%	0.1%	0.1%	0.1%

SOURCE: ASSESSING NEW JERSEY'S EXPOSURE TO SEA-LEVEL RISE AND COASTAL STORMS: REPORT OF THE NEW JERSEY CLIMATE ADAPTATION ALLIANCE SCIENCE AND TECHNICAL ADVISORY PANEL (STAP REPORT), 2016. ESTIMATES ARE BASED ON (KOPP ET AL., 2014)

In addition to concerns associated with SLR impacts to developed areas, the ability of the District's natural areas to withstand the effects of climate change is paramount to any planning efforts to address SLR in the District. Natural areas support an increasingly diverse ecosystem in the Meadowlands, and are assumed to be at risk when marshland potentially inundated due to SLR meets developed area boundaries.

In a June 2018 report, "Measuring Elevation Change in Meadowlands Marshes Using Surface Elevation Tables (SETs) and Marker Horizons," MERI monitored the rates of accretion and subsidence at five tidal wetland locations in the District over a period of ten years, which provides an indication as to average elevation change in the District's wetlands. The study found that accretion, resulting from the accumulation of sediment, was the main contributor to elevation increases observed on the wetland sites. The rate of elevation change on the sites was observed within the range of 2.44 to 4.00 mm per year (see Figure 9.4 "Surface Elevation Change of Select Marshes in the District"). The study indicates that the elevation rates observed indicate the District's wetlands are currently generally well adapted to keep up with the rising sea levels, and that accretion and elevation rates

can generally be expected to stabilize as time passes, unless there is a large weather event or human impact on the sites. Therefore, it is essential that the District’s wetland areas and their ability to support a thriving ecosystem in the face of climate change be addressed as part of resiliency planning initiatives in the District.

Figure 9.4 SURFACE ELEVATION CHANGE OF SELECT MARSHES IN THE DISTRICT

LOCATION		MARSH TYPE	DOMINANT VEGETATION	RATE OF ELEVATION CHANGE - 2008 TO 2018 (MM/YR.)
RBP	Riverbend Patens	High Marsh	Spartina patens	4.00
RBM	Riverbend Mixed	High Marsh	Phragmites australis / Spartina patens	3.67
SM	Sawmill	High Marsh	Spartina alterniflora	3.94
LR	Lyndhurst Riverside	High Marsh	Phragmites australis	2.44
SHS	Secaucus HS	Low Marsh	Spartina alterniflora	3.93

SOURCE: MERI (2018)

B. PLANNING FOR CLIMATE CHANGE AND SEA LEVEL RISE

Preparing for climate change is not about making a community “climate proof,” but making it “climate resilient.” A climate resilient community is one that takes proactive steps to prepare for (i.e., reduce the vulnerabilities and risks associated with) projected impacts. ^x

Climate change impacts do not follow jurisdictional boundaries and thus may require new collaborations and/or strengthening of existing partnerships with local, state and federal governments, non-profits and the private sector. It is critical that partnerships are developed and/or strengthened that may reduce vulnerability and risk associated with the impacts of sea level rise. ^{xi}

Government responses to sea level rise fall into two categories: reactive or proactive, and structural or non-structural. Reactive responses take place after an impact has occurred, and can be structural or non-structural. Reactive responses include non-structural actions, such as imposing restrictions regarding reconstruction or acquiring properties after impacts have taken place, and structural actions, such as building armoring structures. Proactive responses, which are often non-structural, require effective planning to prevent negative impacts from natural hazards.

In the context of coastal storm risk management, nonstructural measures are defined as those that reduce human exposure to a flood hazard without altering the nature or extent of the hazard. Nonstructural measures are intended, generally, to reduce the consequences from flooding events. Operation and maintenance costs of nonstructural measures are usually low, and such measures are sustainable over the long term. ^{xii}

Structural responses (or hard armoring) change the nature of the hazard that they protect against and involve engineering solutions to manage flood risk and reduce damage from coastal storms. Typical structural solutions include levees, floodwalls, beaches, and dunes, which are intended to physically limit flood water inundation from causing damage. ^{xiii} Such solutions should be assessed against the potential of exacerbating negative impacts on neighborhood properties.

V. RESILIENCY STRATEGIES

The NJSEA recognizes that existing regulations, policies, and practices may need to be modified in the future to increase resiliency, to allow for reevaluation and adjustment in accordance with changing conditions in a forward-thinking manner, and avoid trends that increase future vulnerabilities or reduce adaptive capacity. Modifications should consider strategies to diversify options with respect to adaptive capacity by providing new “buffers” against climate change impacts. x

This plan provides a review of potential strategies available to address sea level rise, and whether these strategies may be appropriate for future NJSEA implementation. The following nonstructural measures, frequently mentioned in current literature on SLR, may or may not be applicable to properties within the District, but form the foundation for continued discussion to address the impacts of SLR in the District. Strategies



that are deemed to have potential utility in the District will be recommended for future in-depth study. The potential strategies evaluated in an effort to promote a resilient and sustainable Meadowlands region include the following:

1. Comprehensive Planning;
2. Overlay Zones;
3. Floodplain Regulations;
4. Construction Codes;
5. Setbacks/Buffers;
6. Conditional Development;
7. Rebuilding Restrictions;
8. Hard Armoring;
9. Soft Armoring and Green Infrastructure;
10. Acquisitions;
11. Conservation Easements; and
12. Rolling Conservation Easements.

A. COMPREHENSIVE PLANNING

Through this Master Plan, the NJSEA is proactively affirming the agency’s commitment towards adaptation planning beyond the ongoing measures practiced by the agency over the past several decades.

Future NJSEA tasks to increase the resiliency of the District include the following:

1. Study and identify potential impacts from sea level rise;
2. Assess vulnerabilities and select responsive strategies to incorporate within future amendments to the District Zoning Regulations;
3. Identify areas in the District that may be targeted for increased levels of protection;
4. Identify land use tools that are available to the NJSEA; and
5. Discuss a timeline for future implementation.

B. OVERLAY ZONES

Overlay zoning allows the addition of regulatory requirements upon an existing zone to supplement regulations in areas with special features. ^{xiii} The existing zone is not disrupted, thereby allowing flexibility in the administration of zoning requirements. Overlay zones are frequently used to protect unique natural or cultural resources. One example of overlay zoning in this context is a “sea level rise overlay zone,” in which special regulations would apply only to the designated overlay zone. Overlays can be used to increase freeboard (a factor of safety usually expressed in feet above base flood elevation), increase setbacks, limit new development, and/or require additional floodproofing measures for new structures or additions.

Depending upon goals for a particular location, overlay zones could also include the following:

1. Protection zone: In densely developed areas, require soft armoring techniques wherever feasible;
2. Accommodation zone: In areas that permit new development but limit its intensity, hard armoring could be limited, and retrofits or resilient design could be required;
3. Retreat zone: Hard armoring would be prohibited, rebuilding damaged structures could be prohibited, and inundated structures would be removed or relocated. Retreat zones could be supplemented with incentives for relocation, such as acquisitions, conservation easements, or tax incentives; and
4. Preservation zone: Areas where natural features are preserved and/or enhanced.

C. FLOODPLAIN REGULATIONS

Floodplain management regulations can be used to implement adaptive measures. A prime example of the effectiveness of floodplain management regulations is FEMA’s NFIP, which aims to reduce the impact of flooding on private and public structures. It does this by providing affordable flood insurance to property owners, renters, and businesses and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. ^{xiv}

The NFIP’s CRS, explained above, is a voluntary program for recognizing and encouraging community floodplain management activities exceeding the NFIP’s minimum standards. ^{xv} Successful implementation of the program by a local community, such as the NJSEA, results in a discount on flood insurance premium rates for residents and businesses in the community. As part of the CRS program, the NJSEA has adopted and enforces certain regulations with minimum design requirements for new construction proposed in SFHAs, where the NFIP’s floodplain management regulations must be enforced and the mandatory purchase of flood insurance applies. ^{xvi}

Floodplain management planning provides many benefits for the District, including the following:

1. Identification of existing and future flood-related hazards and their causes;
2. Ensuring that a comprehensive review of all possible activities and mitigation measures is conducted so that the most appropriate solutions will be implemented to address the hazard;
3. Ensuring that the recommended activities meet the goals and objectives of the NJSEA, are consistent with land use and comprehensive planning goals, do not create conflicts with other activities, and are coordinated so that the costs of implementing individual activities are reduced;
4. Ensuring that the criteria used in NJSEA land use and development programs account for the hazards faced by existing and new development;
5. Education of residents and property owners about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains;
6. Building public and political support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains; and
7. Building a constituency that wants to see the plan's recommendations implemented.

Presently, the NFIP does not account for future impacts from sea level rise. FEMA uses historical data only to assess vulnerability to flooding; however the CRS program encourages communities to impose more stringent regulations pursuant to a FEMA-approved Flood Insurance Study (FIS).

D. CONSTRUCTION CODES

The NJSEA is responsible for construction code plan review of proposed development within the District in accordance with New Jersey's Uniform Construction Code (NJ UCC). Construction codes can be used to promote resilient design by maximizing the ability of structures to withstand flooding. Design requirements are routinely used to reduce flooding impacts to coastal development. Building retrofit measures can include elevation of the structure or finished floor, dry or wet floodproofing, perimeter ringwalls, relocation, or demolition. The NFIP has different design requirements for construction in the different designated zones of the SFHAs. Future considerations may include requiring more restrictive construction code requirements in areas at risk from SLR.

E. SETBACKS/BUFFERS

Setbacks are defined within the District Zoning Regulations as the distance between a structure and the lot line. Structures are not permitted within the required setback, which can be at the front, rear, or side of a property. Buffers are similar to setbacks in that they require adequate distances be maintained in certain areas, generally between uses of varying intensity. Waterway buffers include natural features that may reduce flood impacts, provide water filtration, preserve views, provide recreational opportunities, and serve as crucial habitats. ^{xiii}

The District zoning regulations specify minimum front, rear and side yard setbacks, as well as minimum buffers that require certain distances be maintained from waterways. Fill, fill, structures, and impervious pavements are not permitted within a required waterway buffer. The NJSEA should ensure that ample development setbacks from tidal marshes and open tidal waters are established to accommodate projected marsh migration. ^{xvii}

F. CONDITIONAL DEVELOPMENT

Special conditions can be applied when granting certain types of development approvals to mitigate negative impacts. Impact fees, land use restrictions, deed restrictions and dedications are types of conditions that may be imposed on developers or property owners.

G. REBUILDING RESTRICTIONS

Restrictions on rebuilding can limit a property owners' ability to reconstruct after damage or destruction caused by natural hazards. Restrictions would not apply until after the property has been significantly impacted. In general, there are three categories of rebuilding restrictions that could be applied to limit reconstruction, particularly in areas with repetitive flooding losses:

1. Allow limited rebuilding: Limitations on rebuilding would allow smaller, more resilient structures to be built, and additional setbacks or buffers could also be required.
2. Prohibit rebuilding: Prohibition on rebuilding structures that have been repetitively damaged or are located in flood prone areas.
3. Allow reconstruction with conditions: Conditions on reconstruction could allow properties to be rebuilt while prohibiting or limiting armoring in order to minimize potential detriments to landforms and fish and wildlife habitats associated with such measures, or require that structures be removed when threatened by inundation or erosion.

In certain areas of the New Jersey Shore, there are two categories of post-Sandy building restrictions that have been implemented by FEMA to reduce repetitive losses. The first is limited resilient rebuilding, which requires damaged structures to be replaced by more resilient structures, or else be moved away from the coast. ^{xii} The second is conditional reconstruction, wherein conditions include, among other things, limits on future rebuilding or the purchase of additional flood insurance.

H. HARD ARMORING

Hard armoring or protection refers to engineered structures that defend against coastal hazards, including seawalls, tide gates, storm surge barriers, floodwalls, revetments, and bulkheads. While fairly commonplace, such protective measures may result in negative consequences to surrounding properties by shifting the floodwaters and erosion away from the property protected by hard armoring. In the context of sea level rise, these structures form barriers that impede the ability of the natural shoreline and habitats to migrate inland over time. ^{xviii} Armoring can also have the effect of encouraging development in vulnerable areas, thereby enhancing the risk to people and property in the event of failure. ^{xiii}

I. SOFT ARMORING AND GREEN INFRASTRUCTURE

Soft armoring allows the creation or restoration of a natural shoreline system using nature-based shoreline management techniques. ^{xix} In the District, soft armoring could allow natural inland migration of wetlands as the sea level rises.

In accordance with New Jersey's CZM Rules at N.J.A.C. 7:7-1.5, a living shoreline is "a shoreline management practice that addresses the loss of vegetated shorelines, beaches, and habitat in the littoral zone by providing for the protection, restoration, or enhancement of these habitats." ^{xx} Such living shorelines can be accomplished through the strategic placement of plants, stone, sand or other structural and organic materials. Natural living shorelines include natural vegetation, submerged aquatic vegetation, fill, and biodegradable organic materials. Hybrid living shorelines incorporate natural vegetation, submerged aquatic vegetation, fill, biodegradable organic materials,

and low-profile rock structures such as segmented sills, stone containment, and living breakwaters seeded with native shellfish.

Green infrastructure, such as bioswales, rain gardens, green roofs, and permeable pavement, refers to environmental solutions designed to reduce flow volumes and peaks (through infiltration and storage) and treat stormwater at its source, while also providing potential social, environmental, or economic benefits. ^{xxi} Gray infrastructure refers to constructed structures such as treatment facilities, stormwater systems, sewer systems or storage basins. ^{xxii} In conjunction with gray infrastructure, interconnected networks of green infrastructure can enhance community resiliency by increasing water supplies, reducing flooding, combating urban heat island effect, and improving water quality. ^{xxiii}

The RBDM Project will be implementing various green infrastructure concepts in the RBD Meadowlands Study Area, including bioswales, storage trenches, and rain gardens. For a detailed discussion and analysis of these green infrastructure improvements and their locations, please refer to the Rebuild by Design Meadowlands Project Final Environmental Impact Statement at <https://www.nj.gov/dep/floodresilience/rbd-meadowlands-feis.htm>.

J. ACQUISITIONS

State and local government entities can use public funds to purchase privately held lands for conservation purposes and to promote public health and safety. Property acquisitions in flood-prone areas are not a new concept; typically, such programs are pursued after disaster has occurred, often repeatedly. A pre-emptive approach to acquisitions in the context of sea level rise could be a viable option in the District.

In the face of increasingly frequent and powerful coastal storms anticipated in the New York/New Jersey metropolitan region, buyout programs can be designed and implemented to yield successful outcomes for residents and government entities alike. ^{xxiv} The NJDEP Blue Acres Program (within the Green Acres Program) purchases improved residential lots in flood prone areas, or properties that may buffer or protect other lands from such damage, and, once acquired, removes any structures and improvements from the floodplain. ^{xxv} The voluntary buyout program was expanded after Superstorm Sandy with funding from FEMA, HUD, and the United States Department of Agriculture (USDA).

In New Jersey, neighborhoods are evaluated based on several criteria, including the following:

- Flood damage from Superstorm Sandy, or repeated flood damage from previous storms, such as in the Passaic River Basin;
- Willing sellers. The Blue Acres program is a strictly voluntary program for willing sellers only;
- Support from the local government;
- Clusters of flood-prone homes, or whole neighborhoods;
- Cost-effectiveness of the buyout according to FEMA guidelines under Federal law;
- Opportunity for significant environmental impact and/or improvement to public health, safety, and welfare.

The Blue Acres Program also considers communities with a high concentration of homes that experienced the most severe damage from Superstorm Sandy, as well as communities with homes that have submitted repeated flood insurance claims under the National Flood Insurance Program. ^{xxvi} Through a combination of state and federal funding, the Blue Acres Program is able to acquire improved and vacant parcels in order to realize preservation of entire neighborhoods.

Acquisition programs can be used proactively to target at-risk properties. Sea level rise projection data and mapping enables practitioners to reliably gauge the location and timing of SLR impacts, which can be used to develop acquisition plans for the most vulnerable properties.

The MCT currently owns and manages nearly 1,000 acres of wetlands and environmentally sensitive lands both in the District and in municipalities outside of the District. It is anticipated that with future funding, the MCT will continue to actively seek out environmentally sensitive properties to preserve.

K. CONSERVATION EASEMENTS

A conservation easement is a voluntary legal agreement between a landowner and a government, land trust or other qualified organization, in which permanent limitations are placed on the use of the owner's property, in exchange for money or a tax incentive, in order to sustain the natural function of the land. ^{xxvii}

While commonly used to conserve open space and farmland, conservation easements may be a viable strategy for protecting wetlands in the District. This strategy allows for marsh migration as tidal waters encroach upon undeveloped uplands, where tidal marshes may form on these newly submerged lands. In the context of sea level rise, conservation easement provisions could include prohibiting the removal of vegetation and restricting land uses that might contribute to erosion. Because a property will be limited in its use, conservation easements may reduce the value of property, thereby potentially reducing the property tax bill for the owner. ^{xxviii}

Less common arrangements include future interest agreements that would allow property owners in at-risk areas to receive compensation for their property but permit them to remain until it is no longer viable to do so.

L. ROLLING CONSERVATION EASEMENTS

A rolling easement is a broad term that refers to any public policy that protects lands in the public trust as the sea level "rolls" inland. ^{xli} Unlike traditional conservation easements that prohibit development in exchange for compensation, rolling easements can allow for limited development of uplands but prohibit armoring or other development that could interfere with the tide. As the property is inundated, the easement terms would require that all structures be removed. Such easements reduce the exposure to coastal flooding, but also allow for long-term managed coastal retreat and a reduction in repetitive loss properties. While the use of rolling easements for sea level rise is an innovative concept, it is currently untested, so the difficulties involved in their establishment or implementation are unknown at this time.

VI. CONCLUSION

The NJSEA recognizes the importance of planning for resiliency in the face of sea level rise. This chapter has presented a variety of potential future strategies to enhance the resiliency of the District. It is recognized that not every strategy will be feasible for implementation by the NJSEA, but it is important to explore all strategies that may be applicable.

The RBDM Project, as well as all future resilience projects, should be coordinated with future flood control and environmental mitigation endeavors within the District (i.e. the activities associated with the environmental cleanup of the Berry's Creek Study Area, which is part of the Ventron/Velsicol Superfund site), to ensure that the various projects achieve their goals in a complementary manner.

Planning for resiliency cannot be conducted in a vacuum, and it is essential that the NJSEA coordinate with its public and private partners to best prepare the District for the climate-related challenges ahead.

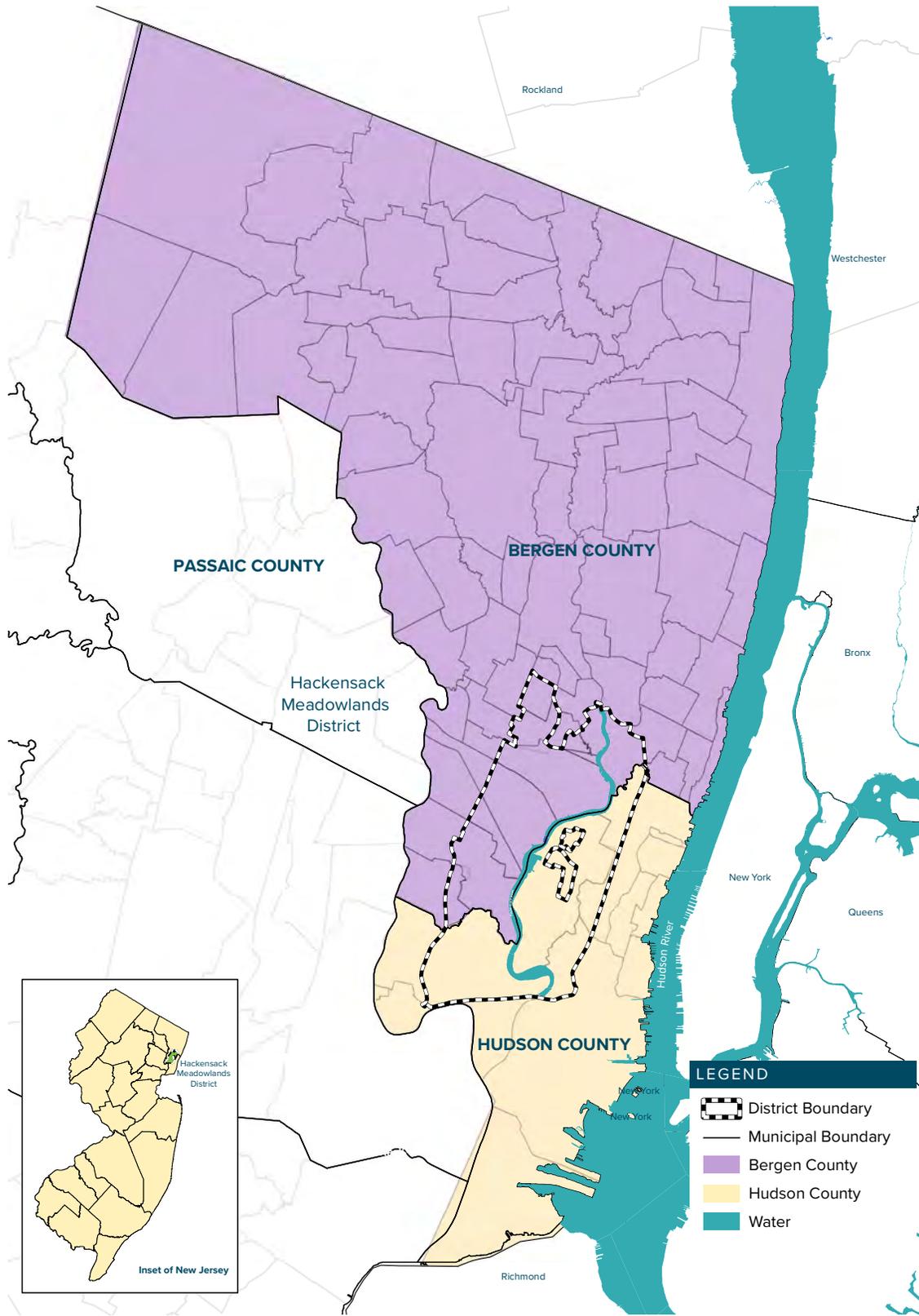


FOOTNOTES

- ⁱ King, Dennis M. and Price, Elizabeth W., *Developing Defensible Wetland Mitigation Ratios*, University of Maryland Center for Environmental Science, 2004.
- ⁱⁱ https://www.nj.gov/dep/floodresilience/docs/rbdm_nepa_rod_20181220_executed.pdf
- ⁱⁱⁱ New Jersey Department of Environmental Protection, <https://www.nj.gov/dep/climatechange/data.html>
- ^{iv} Sweet, W.V., R. Horton, R.E. Kopp, A.N. LeGrande, and A. Romanou, 2017: Sea level rise. In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 333-363, doi: 10.7930/J0VM49F2.
- ^v New Jersey Department of Environmental Protection, <https://www.nj.gov/dep/climatechange/data.html>
- ^{vi} Miller, K. G., Kopp, R. E., Horton, B. P., Browning, J. V, Kemp, A. C., & Al, M. E. T. (2013). *Earth's Future -A geological perspective on sea-level rise and its impacts along the U.S. mid-Atlantic coast Earth's Future*, 3–18.
- ^{vii} Kopp, R.E., A. Broccoli, B. Horton, D. Kreeger, R. Leichenko, J.A. Miller, J.K. Miller, P. Orton, A. Parris, D. Robinson, C.P.Weaver, M. Campo, M. Kaplan, M. Buchanan, J. Herb, L. Auermuller and C. Andrews. 2016. *Assessing New Jersey's Exposure to Sea-Level Rise and Coastal Storms: Report of the New Jersey Climate Adaptation Alliance Science and Technical Advisory Panel. Prepared for the New Jersey Climate Adaptation Alliance. New Brunswick, New Jersey.*
- ^{viii} Haaf, L., Moody, J., Padeletti, A., & Maxwell-Doyle, M. (2015). *Factors Governing the Vulnerability of Coastal Marsh Platforms to Sea Level Rise.*
- ^{ix} "Understanding New Jersey's Vulnerability to Climate Change," Georgetown Climate Center/Rutgers Climate Institute
- ^x *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments*, Center for Science in the Earth System, University of Washington, 2007
- ^{xi} USACE 2014b
- ^{xii} NJBB CSRM interim Feasibility Study and Environmental Scoping Document, 2019
- ^{xiii} *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*, Georgetown Climate Center, 2011
- ^{xiv} <https://fema.gov/national-flood-insurance-program>
- ^{xv} <https://www.fema.gov/media-library/assets/documents/9998>
- ^{xvi} <https://www.fema.gov/special-flood-hazard-area>
- ^{xvii} Ref (on page 75/100) https://www.nj.gov/dep/opi/assets/nwf_final_bescch_070517.pdf
- ^{xviii} California Coastal Commission Sea Level Rise Policy Guidance, 2015.
- ^{xix} Wetlands Watch, www.wetlandswatch.org
- ^{xx} N.J.A.C. 7:7-1.5 (CZM), <https://www.nj.gov/dep/opi/living-shorelines.html>
- ^{xxi} "What is Green Infrastructure?" USEPA, <https://www.epa.gov/green-infrastructure/what-green-infrastructure>
- ^{xxii} National Green Infrastructure Certification Program, <http://ngicp.org/glossary/gray-infrastructure/>
- ^{xxiii} Green Infrastructure for Climate Resiliency, USEPA, https://www.epa.gov/sites/production/files/2015-10/documents/climate_res_fs.pdf
- ^{xxiv} "Buy-In for Buyouts," 2016, Lincoln Institute and Regional Plan Association
- ^{xxv} NJ DEP, <https://www.nj.gov/dep/greenacres/survey/blueacres.html>
- ^{xxvi} "Frequently Asked Questions, September 2015. <https://www.nj.gov/dep/greenacres/pdf/faqs-blueacres.pdf>
- ^{xxvii} Coastal Adaptation Policy Brief, Stanford Center for Ocean Solutions, January 2018
- ^{xxviii} Land Trust Alliance, <https://landtrustalliance.org/topics/taxes> New Jersey Bicycle & Pedestrian Master Plan (2016). <https://www.state.nj.us/transportation/commuter/bike/pdf/bikepedmasterplan2016.pdf>

MAPS

MAP 1: REGIONAL LOCATION



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



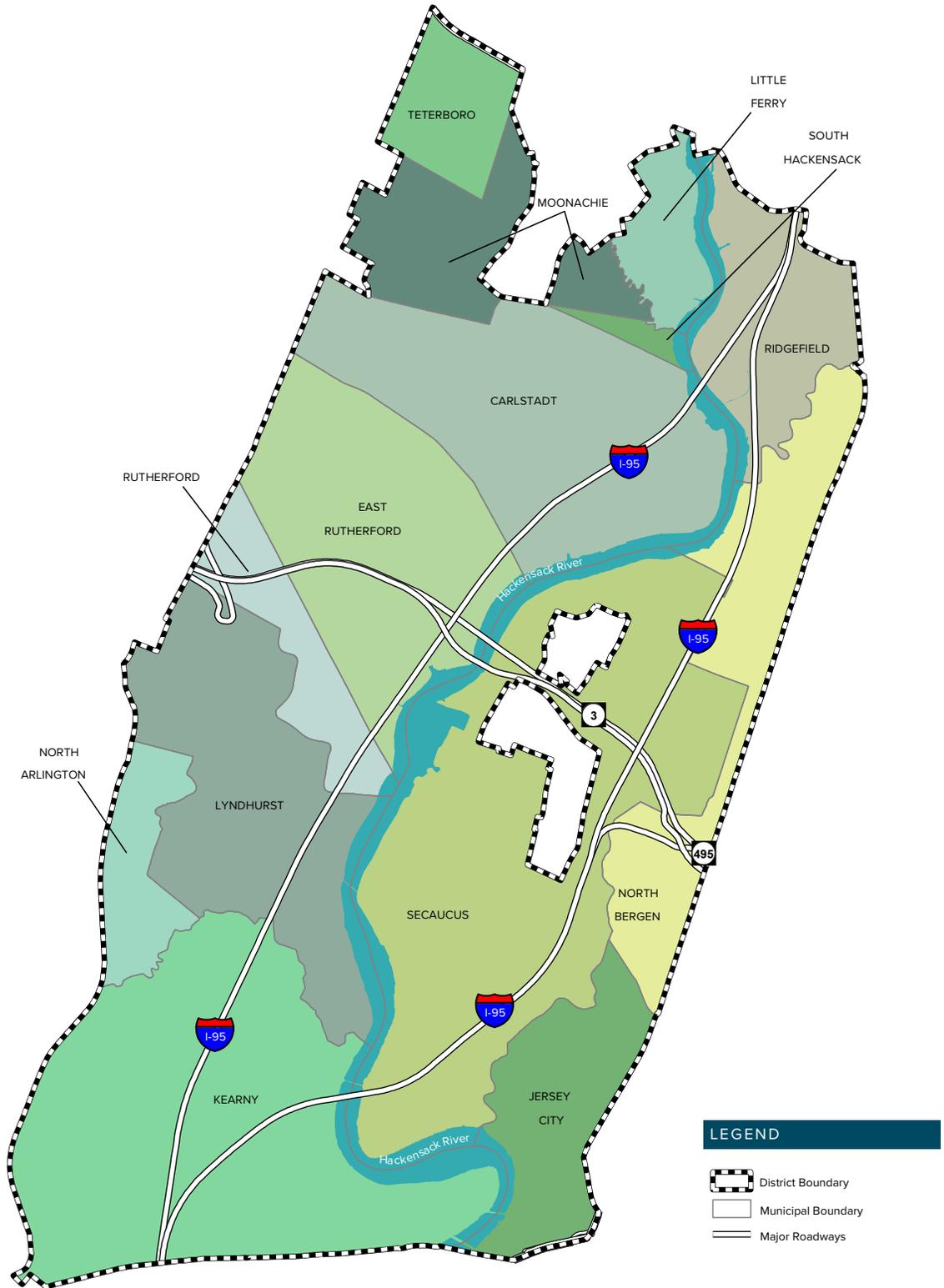
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 1 – REGIONAL LOCATION

MAP 2: DISTRICT MUNICIPALITIES



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet

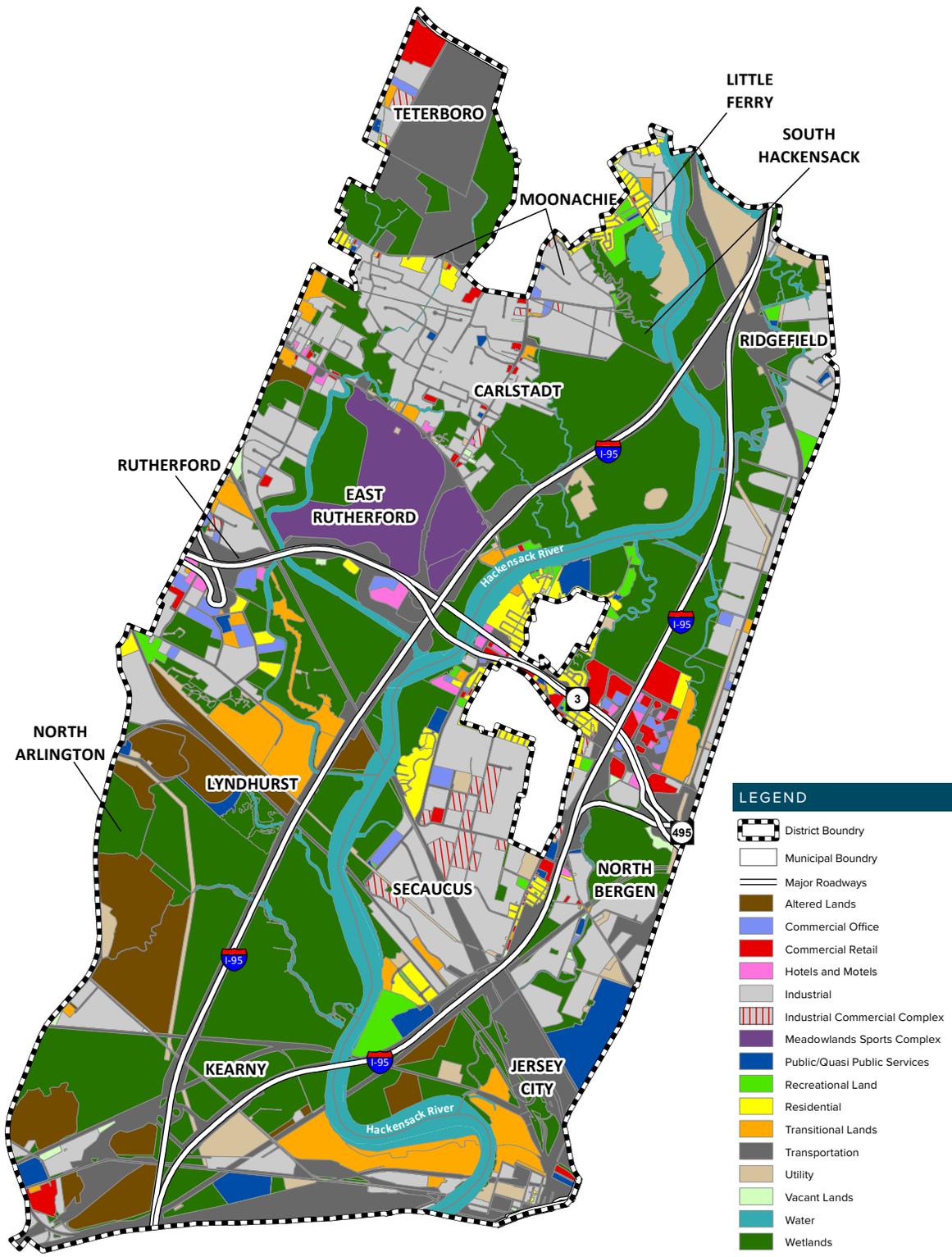


Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 3: EXISTING LAND USE



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT

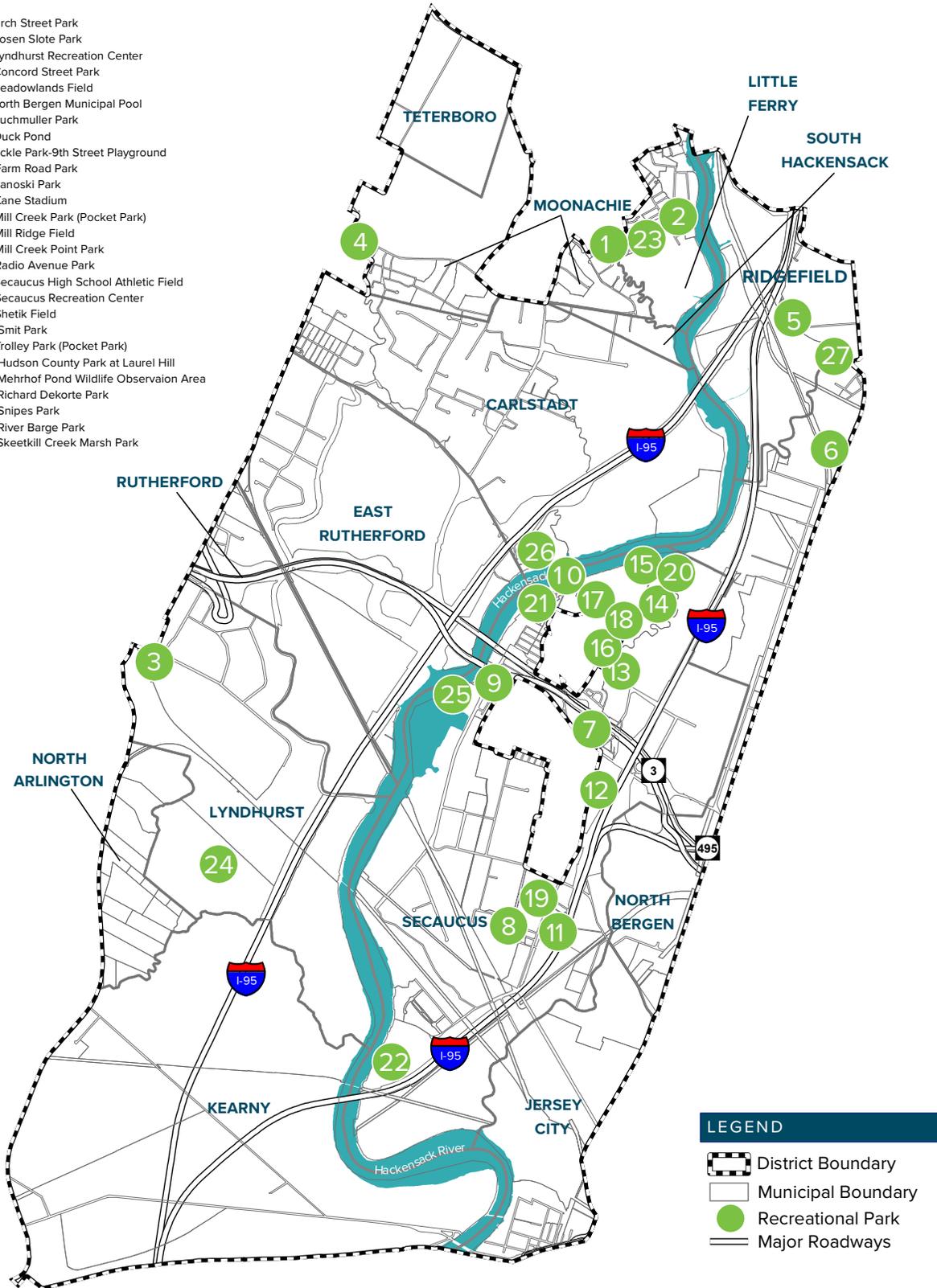


DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 3 – EXISTING LAND USE

MAP 4: PUBLIC PARKLAND

1. Birch Street Park
2. Losen Slote Park
3. Lyndhurst Recreation Center
4. Concord Street Park
5. Meadowlands Field
6. North Bergen Municipal Pool
7. Buchmuller Park
8. Duck Pond
9. Eckle Park-9th Street Playground
10. Farm Road Park
11. Ivanoski Park
12. Kane Stadium
13. Mill Creek Park (Pocket Park)
14. Mill Ridge Field
15. Mill Creek Point Park
16. Radio Avenue Park
17. Secaucus High School Athletic Field
18. Secaucus Recreation Center
19. Shetik Field
20. Smit Park
21. Trolley Park (Pocket Park)
22. Hudson County Park at Laurel Hill
23. Mehrhof Pond Wildlife Observaion Area
24. Richard Dekorte Park
25. Snipes Park
26. River Barge Park
27. Skeetkill Creek Marsh Park



SCALE:
 0 900 1,800 3,600 5,400 7,200
 FEET
 1 inch = 3,500 Feet



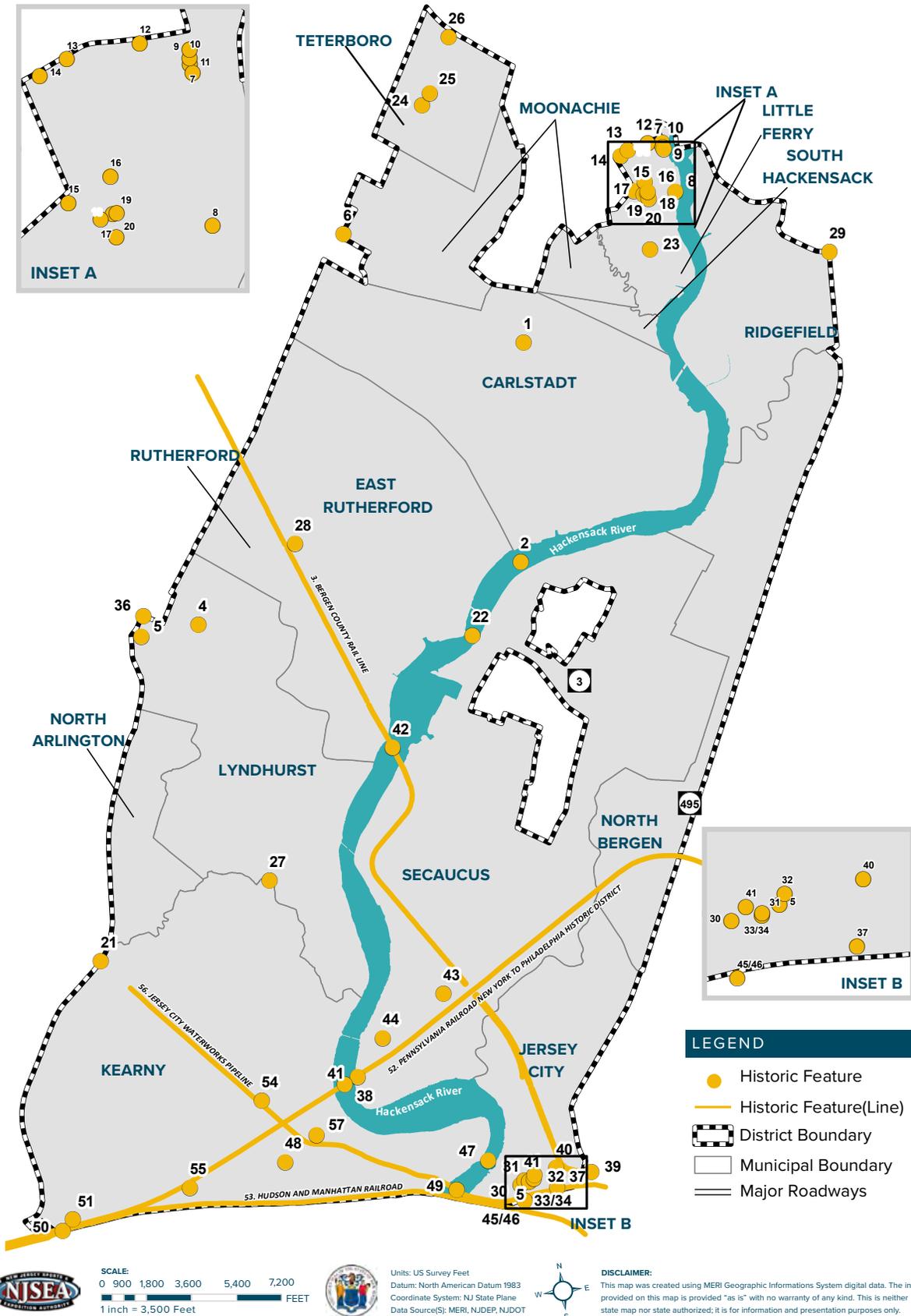
Units: US Survey Feet
 Datum: North American Datum 1983
 Coordinate System: NJ State Plane
 Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
 This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 4 – PUBLIC PARKLAND

MAP 5: HISTORIC RESOURCES

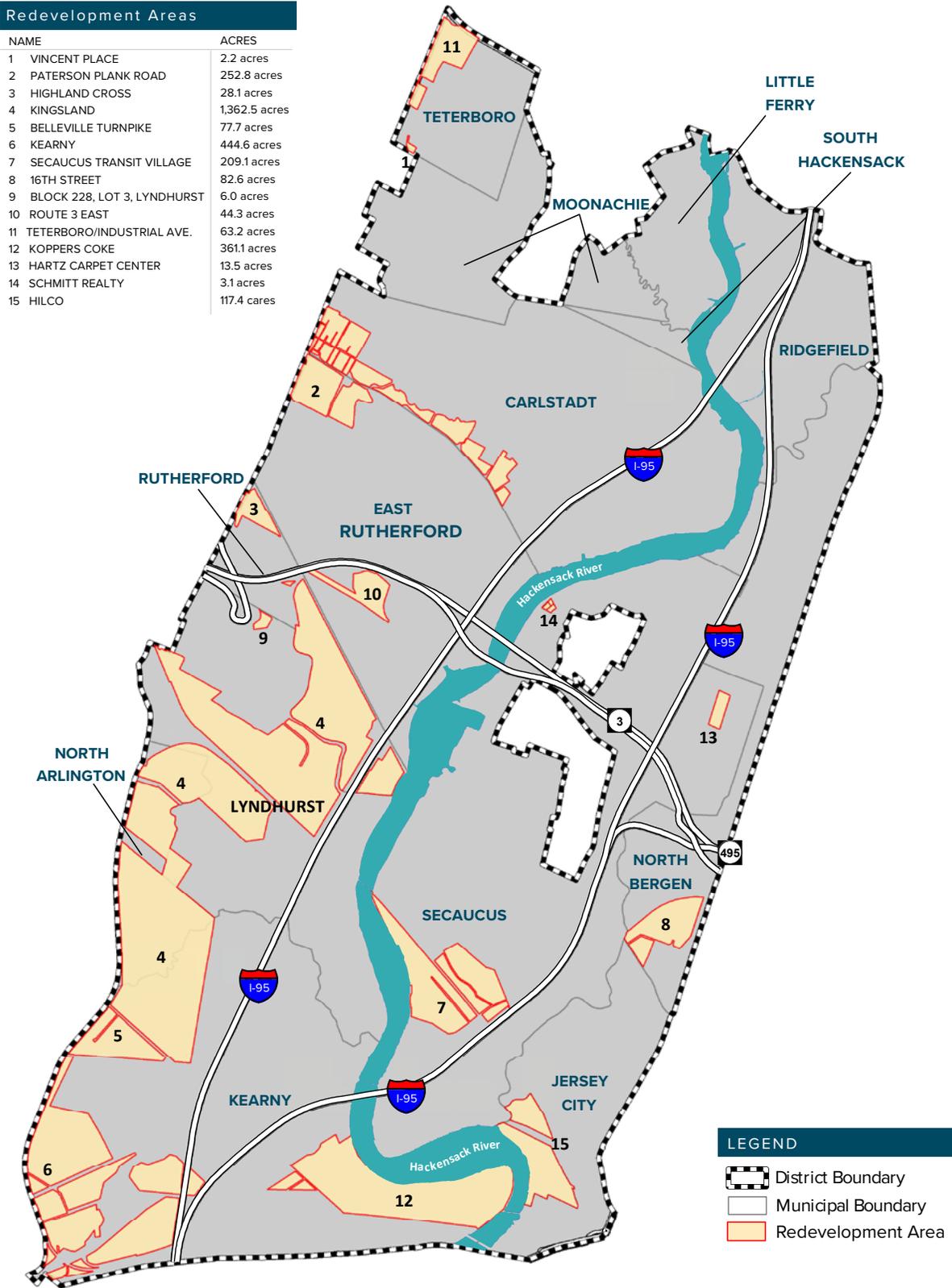


MAP 5 – HISTORIC RESOURCES

MAP 6: REDEVELOPMENT AREAS

Redevelopment Areas

NAME	ACRES
1 VINCENT PLACE	2.2 acres
2 PATERSON PLANK ROAD	252.8 acres
3 HIGHLAND CROSS	28.1 acres
4 KINGSLAND	1,362.5 acres
5 BELLEVILLE TURNPIKE	77.7 acres
6 KEARNY	444.6 acres
7 SECAUCUS TRANSIT VILLAGE	209.1 acres
8 16TH STREET	82.6 acres
9 BLOCK 228, LOT 3, LYNDHURST	6.0 acres
10 ROUTE 3 EAST	44.3 acres
11 TETERBORO/INDUSTRIAL AVE.	63.2 acres
12 KOPPERS COKE	361.1 acres
13 HARTZ CARPET CENTER	13.5 acres
14 SCHMITT REALTY	3.1 acres
15 HILCO	117.4 acres



LEGEND

- District Boundary
- Municipal Boundary
- Redevelopment Area



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



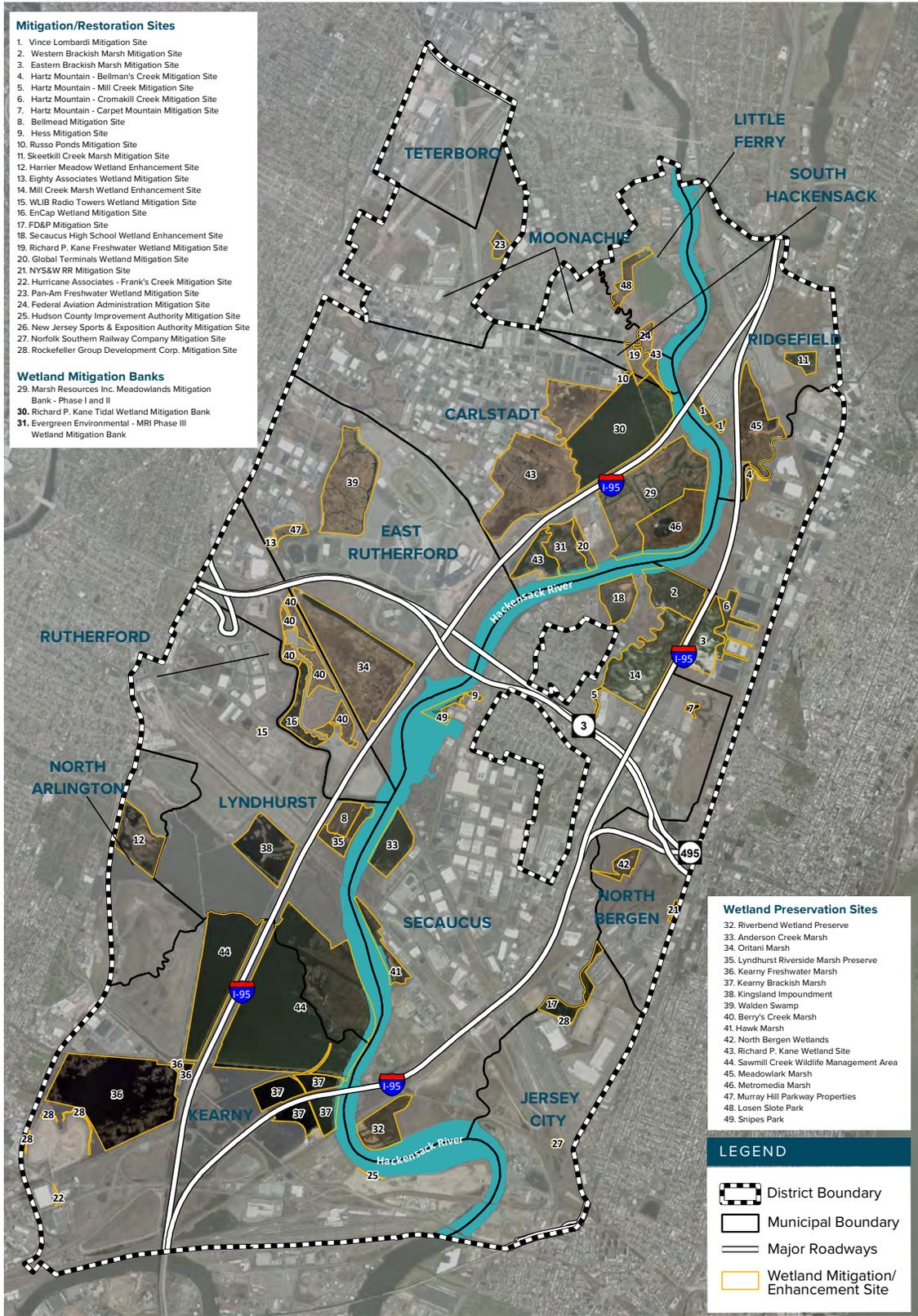
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 6 – REDEVELOPMENT AREAS

MAP 7: WETLAND RESTORATION, MITIGATION, AND PRESERVATION SITES



- Mitigation/Restoration Sites**
1. Vince Lombardi Mitigation Site
 2. Western Brackish Marsh Mitigation Site
 3. Eastern Brackish Marsh Mitigation Site
 4. Hartz Mountain - Bellman's Creek Mitigation Site
 5. Hartz Mountain - Mill Creek Mitigation Site
 6. Hartz Mountain - Cromakill Creek Mitigation Site
 7. Hartz Mountain - Carpet Mountain Mitigation Site
 8. Bellmead Mitigation Site
 9. Hess Mitigation Site
 10. Russo Ponds Mitigation Site
 11. Skeetkill Creek Marsh Mitigation Site
 12. Harrier Meadow Wetland Enhancement Site
 13. Eighty Associates Wetland Mitigation Site
 14. Mill Creek Marsh Wetland Enhancement Site
 15. WLIB Radio Towers Wetland Mitigation Site
 16. EnCap Wetland Mitigation Site
 17. FD&P Mitigation Site
 18. Secaucus High School Wetland Enhancement Site
 19. Richard P. Kane Freshwater Wetland Mitigation Site
 20. Global Terminals Wetland Mitigation Site
 21. NYS&RR Mitigation Site
 22. Hurricane Associates - Frank's Creek Mitigation Site
 23. Pan-Am Freshwater Wetland Mitigation Site
 24. Federal Aviation Administration Mitigation Site
 25. Hudson County Improvement Authority Mitigation Site
 26. New Jersey Sports & Exposition Authority Mitigation Site
 27. Norfolk Southern Railway Company Mitigation Site
 28. Rockefeller Group Development Corp. Mitigation Site
- Wetland Mitigation Banks**
29. Marsh Resources Inc. Meadowlands Mitigation Bank - Phase I and II
 30. Richard P. Kane Tidal Wetland Mitigation Bank
 31. Evergreen Environmental - MRI Phase III Wetland Mitigation Bank

- Wetland Preservation Sites**
32. Riverbend Wetland Preserve
 33. Anderson Creek Marsh
 34. Ortani Marsh
 35. Lyndhurst Riverside Marsh Preserve
 36. Kearny Freshwater Marsh
 37. Kearny Brackish Marsh
 38. Kingsland Impoundment
 39. Walden Swamp
 40. Berry's Creek Marsh
 41. Hawk Marsh
 42. North Bergen Wetlands
 43. Richard P. Kane Wetland Site
 44. Sawmill Creek Wildlife Management Area
 45. Meadowlark Marsh
 46. Metromedia Marsh
 47. Murray Hill Parkway Properties
 48. Losen Slote Park
 49. Snipes Park

LEGEND

- District Boundary
- Municipal Boundary
- Major Roadways
- Wetland Mitigation/Enhancement Site



SCALE:
 0 900 1,800 3,600 5,400 7,200
 FEET
 1 inch = 3,500 Feet



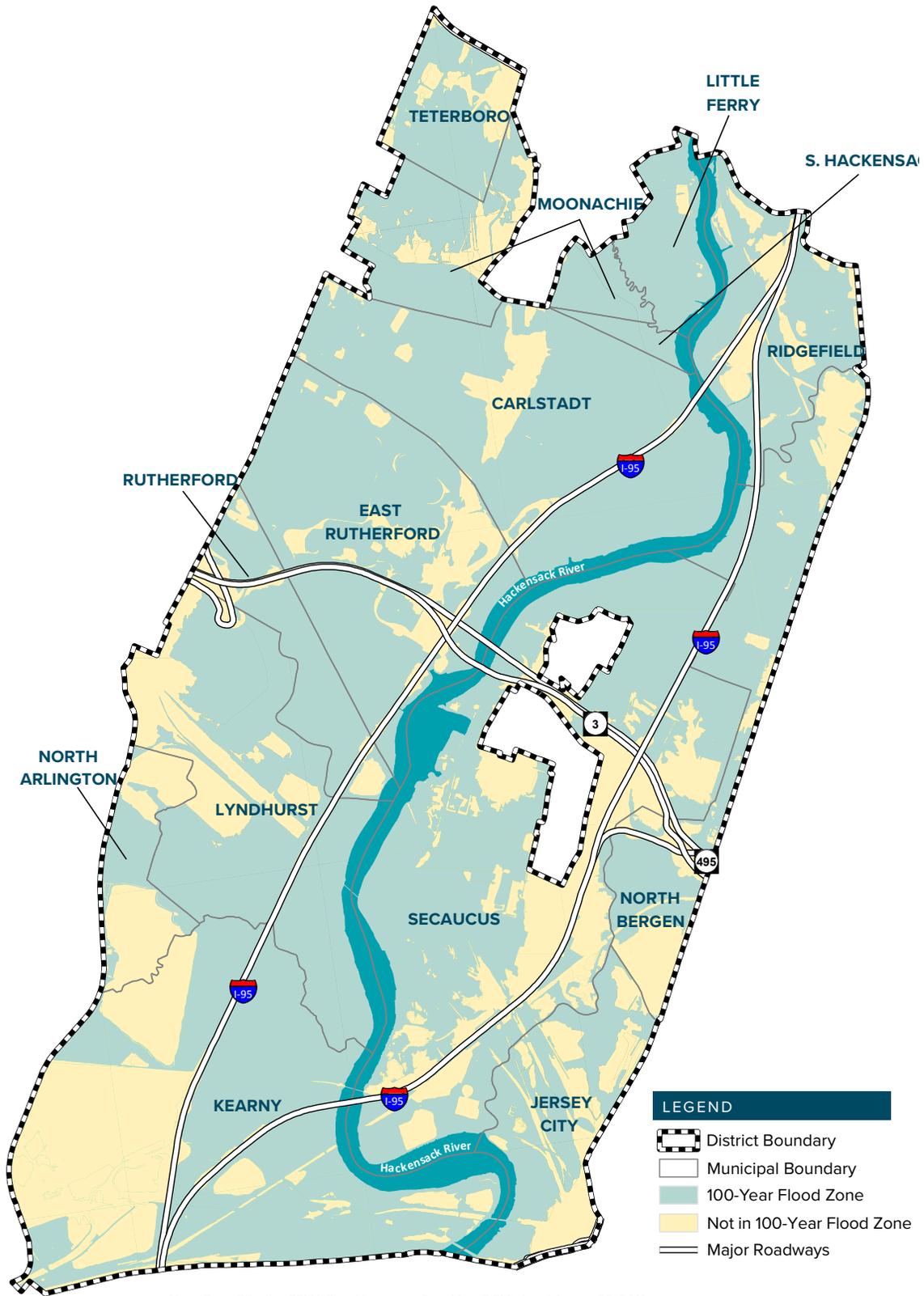
Units: US Survey Feet
 Datum: North American Datum 1983
 Coordinate System: NJ State Plane
 Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
 This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 7 – WETLAND RESTORATION, MITIGATION, AND PRESERVATION SITES

MAP 8: FEMA SPECIAL FLOOD HAZARD AREAS (2019)



Note: From Effective FEMA Flood Insurance Rate Map (FIRM) dated August 28, 2019



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

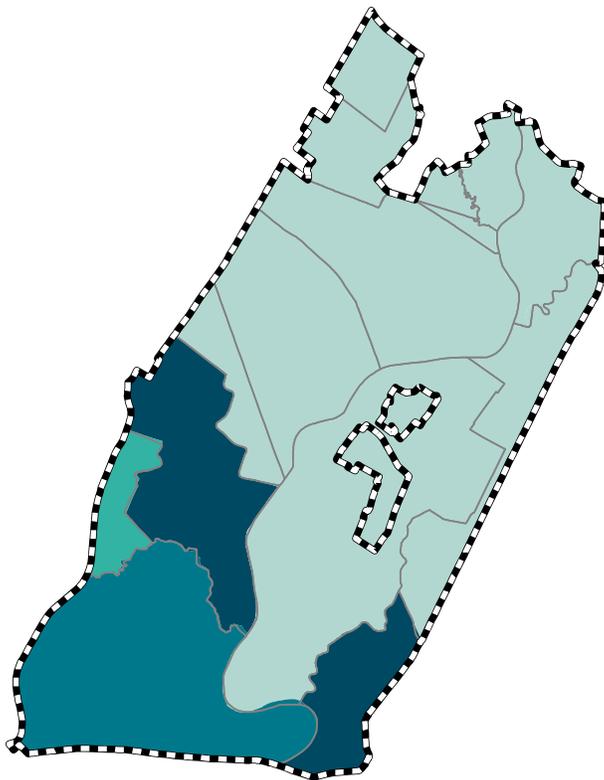
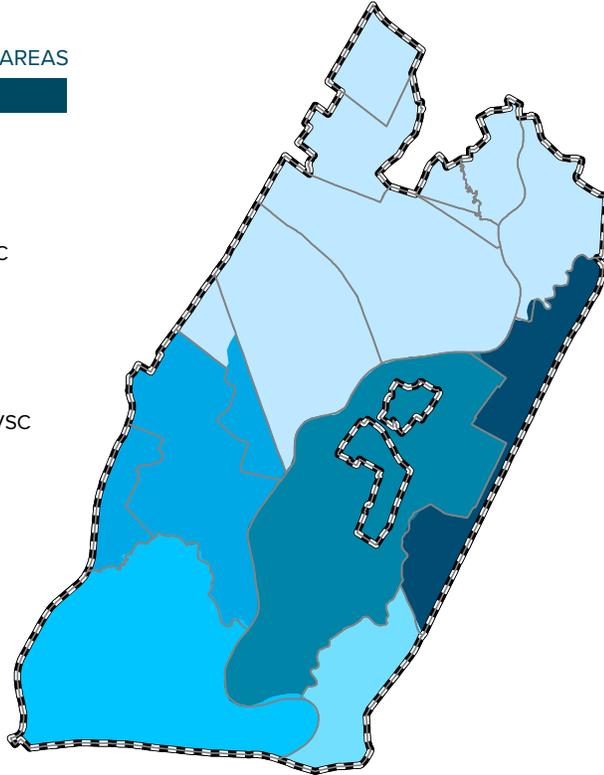
MAP 8 – FEMA SPECIAL FLOOD HAZARD AREAS (2019)

MAP 9: UTILITY SERVICE AREAS

WASTEWATER TREATMENT FACILITY SERVICE AREAS

LEGEND

-  District Boundary
-  Municipal Boundary
-  Bergen County Utilities Authority
-  Jersey City Municipal Utilities Authority/PVSC
-  Kearny Municipal Utilities Authority/PVSC
-  Passaic Valley Sewerage Commission/PVSC
-  Secaucus Municipal Utilities Authority
-  North Bergen Municipal Utilities Authority/PVSC



WATER PROVIDER SERVICE AREAS

LEGEND

-  District Boundary
-  Municipal Boundary
-  Jersey City Municipal Utilities Authority
-  Kearny Water Department
-  Passaic Valley Water Commission
-  Suez Water New Jersey



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet

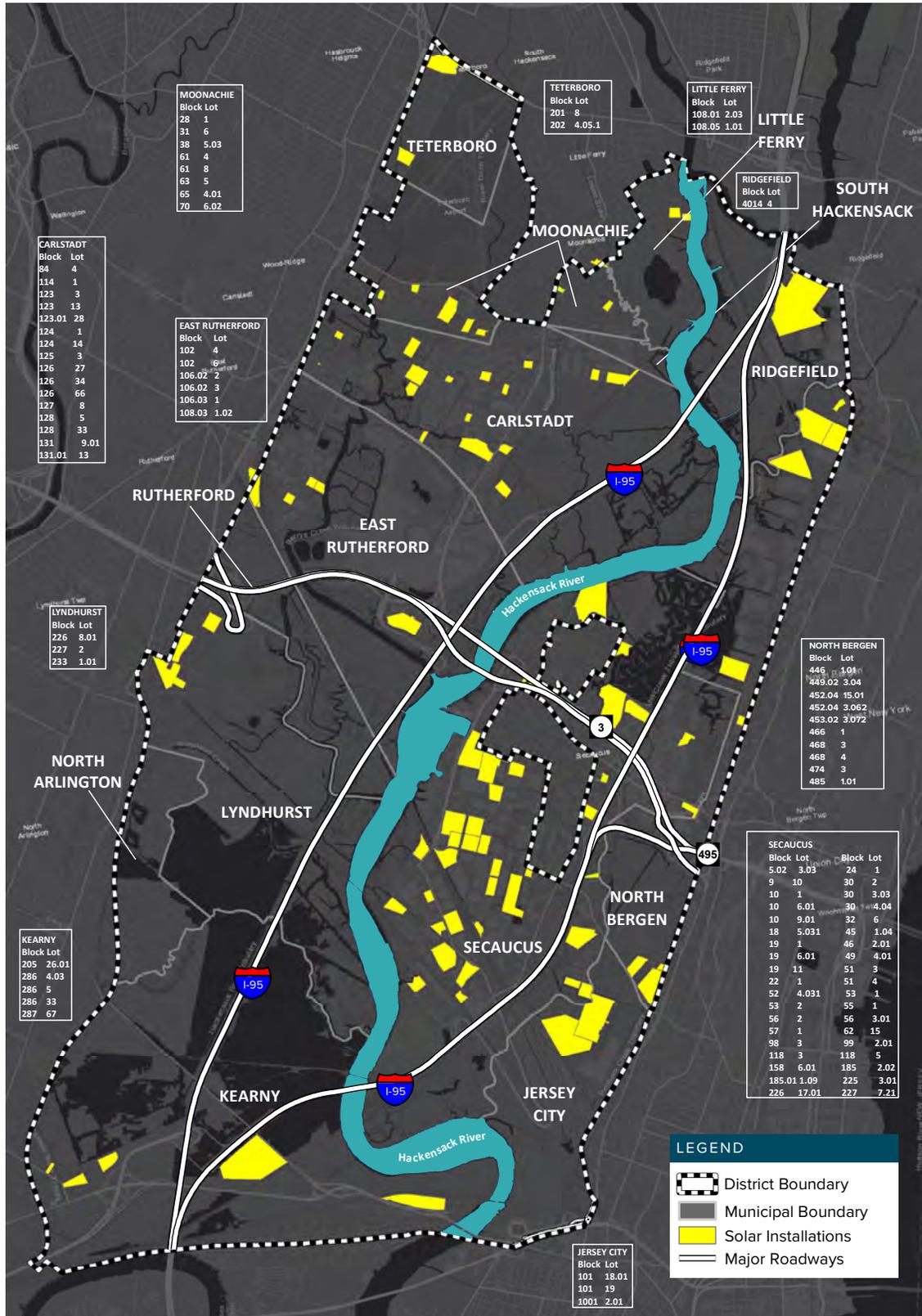


Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Informations System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 10: PHOTOVOLTAIC SOLAR INSTALLATIONS



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



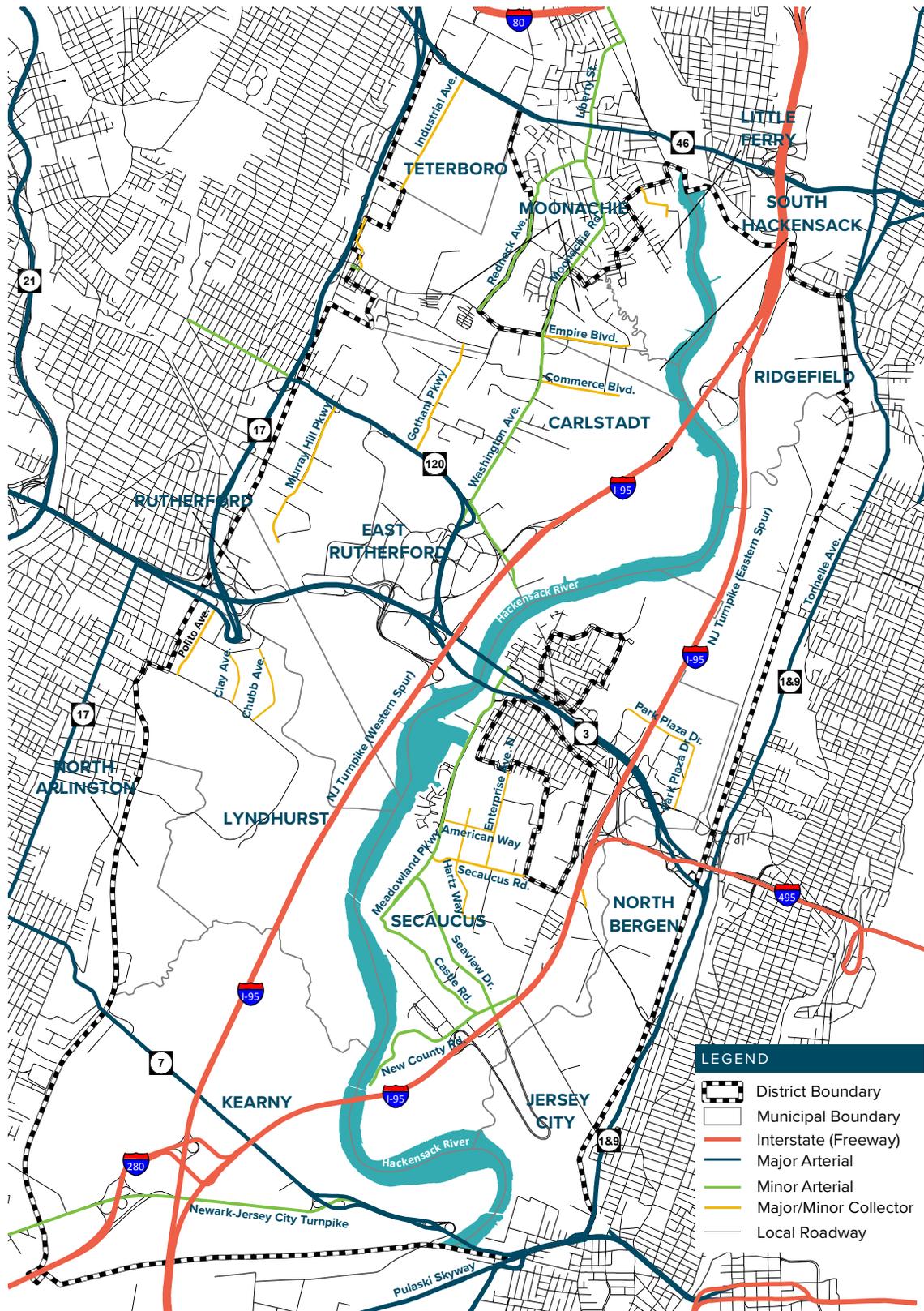
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information Systems digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 10 – PHOTOVOLTAIC SOLAR INSTALLATIONS

MAP 11: ROADWAY NETWORK



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



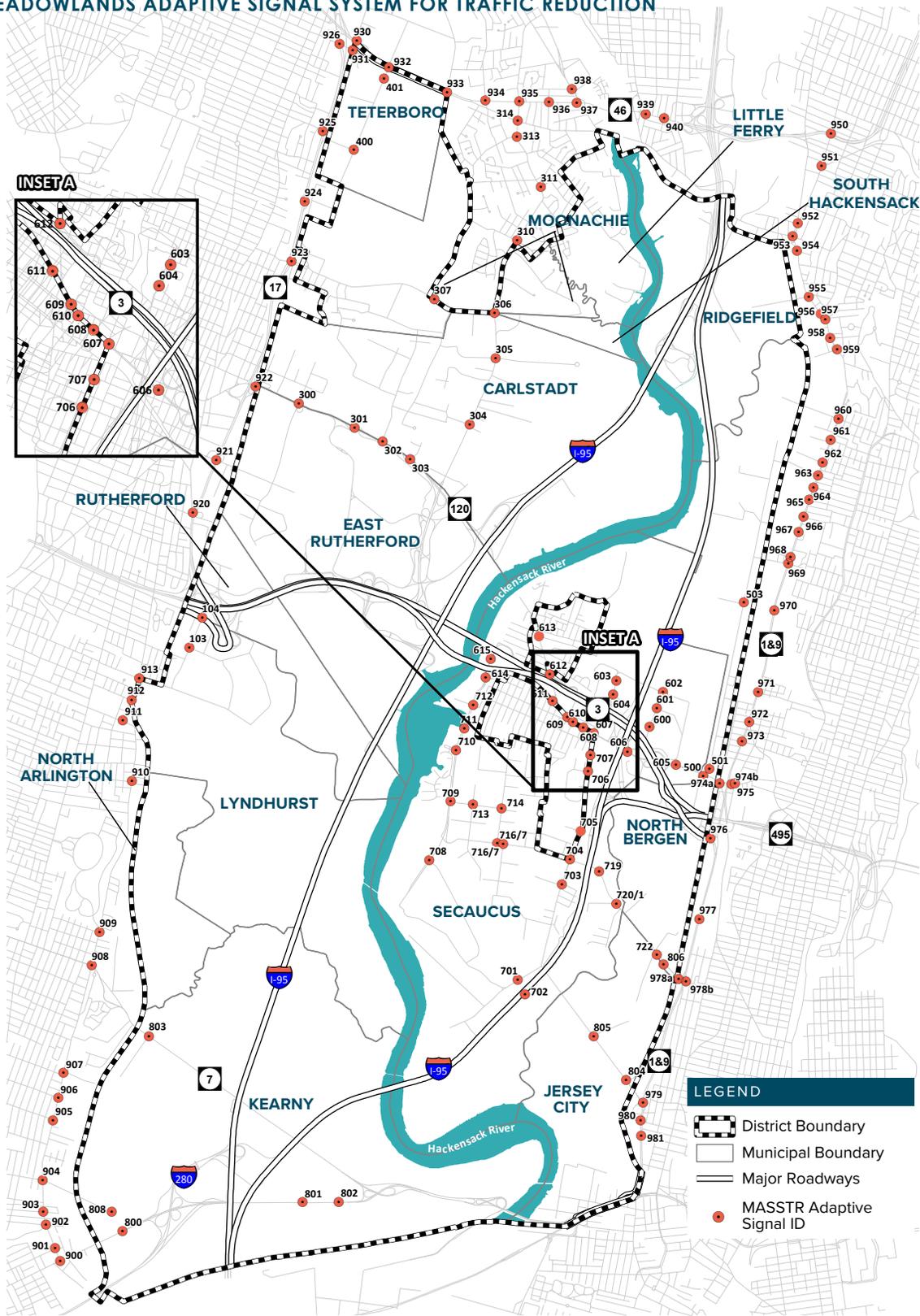
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 12: MASSTR ADAPTIVE SIGNAL MAP

MEADOWLANDS ADAPTIVE SIGNAL SYSTEM FOR TRAFFIC REDUCTION



SCALE:
 0 900 1800 3600 5400 7200
 FEET
 1 inch = 3,500 Feet

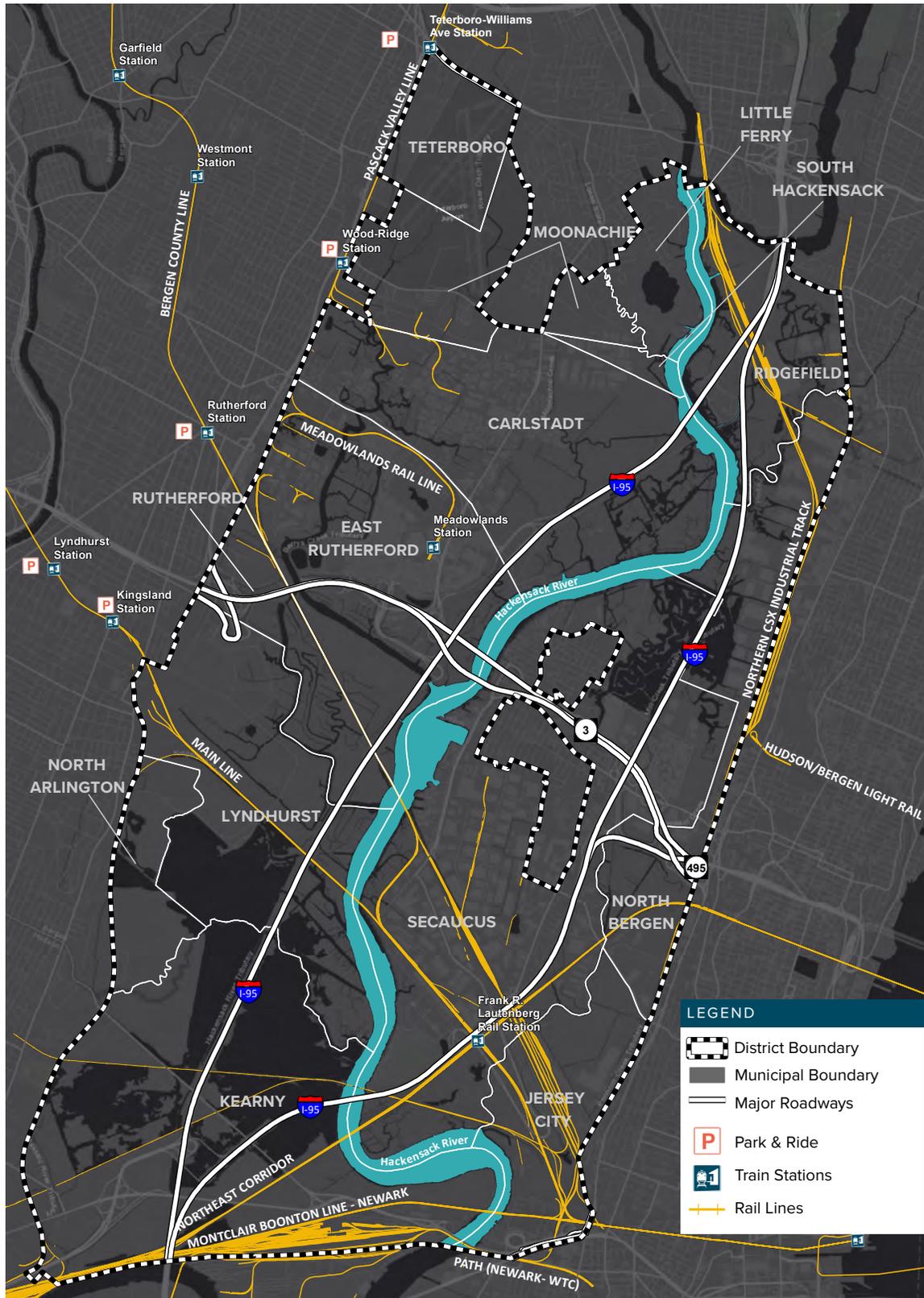


Units: US Survey Feet
 Datum: North American Datum 1983
 Coordinate System: NJ State Plane
 Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
 This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 13: RAIL SYSTEM (PASSENGER & FREIGHT)



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



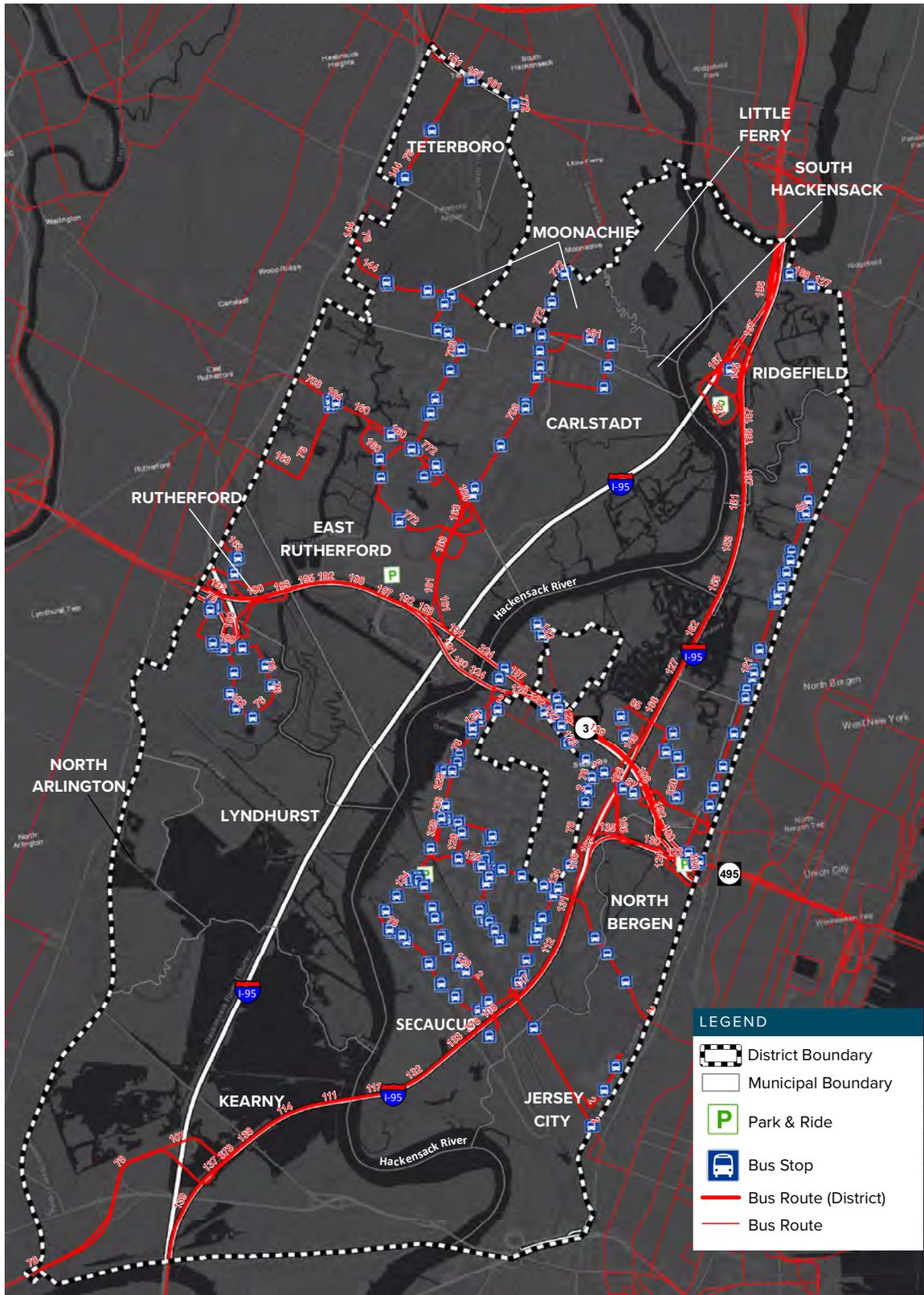
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 13 – RAIL SYSTEM (PASSENGER & FREIGHT)

MAP 14: NJ TRANSIT BUS ROUTES & PARK-AND-RIDE FACILITIES



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



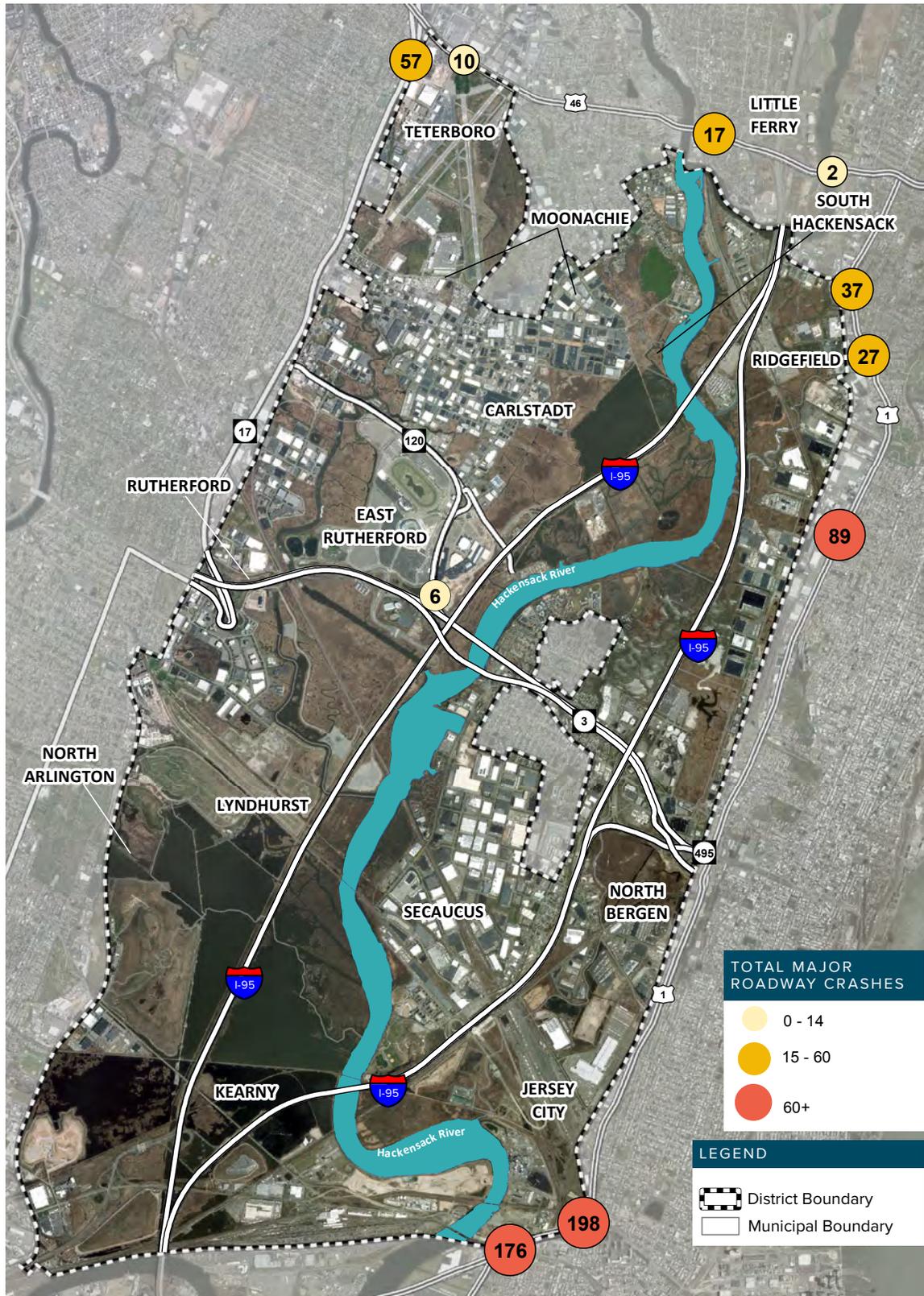
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 14 – NJ TRANSIT BUS ROUTES & PARK-AND-RIDE FACILITIES

MAP 15: NJDOT CRASH DATA (2015 TO 2017)



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 15 – NJDOT CRASH DATA (2015 TO 2017)

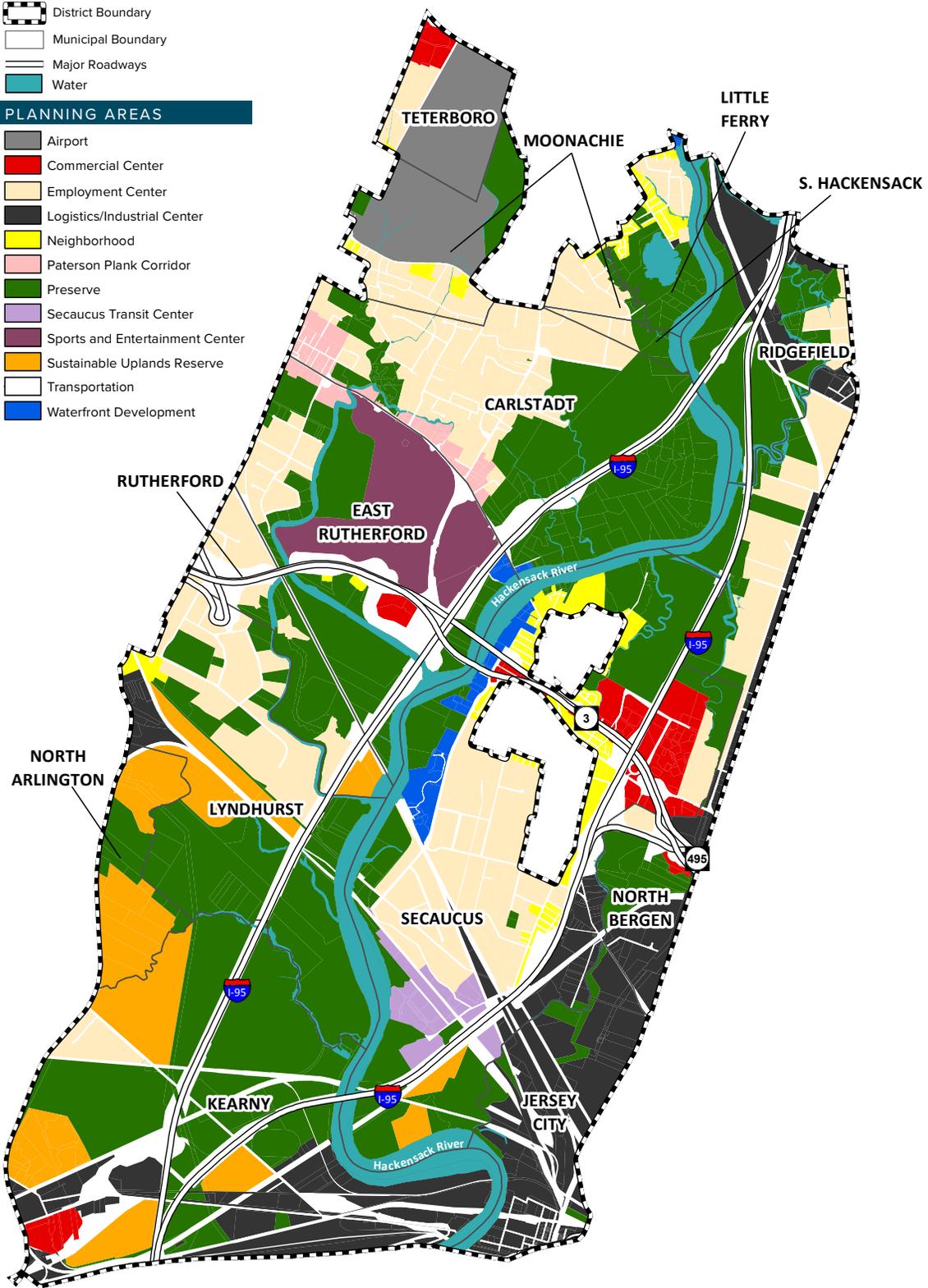
MAP 16: LAND USE PLAN

LEGEND

-  District Boundary
-  Municipal Boundary
-  Major Roadways
-  Water

PLANNING AREAS

-  Airport
-  Commercial Center
-  Employment Center
-  Logistics/Industrial Center
-  Neighborhood
-  Paterson Plank Corridor
-  Preserve
-  Secaucus Transit Center
-  Sports and Entertainment Center
-  Sustainable Uplands Reserve
-  Transportation
-  Waterfront Development



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet

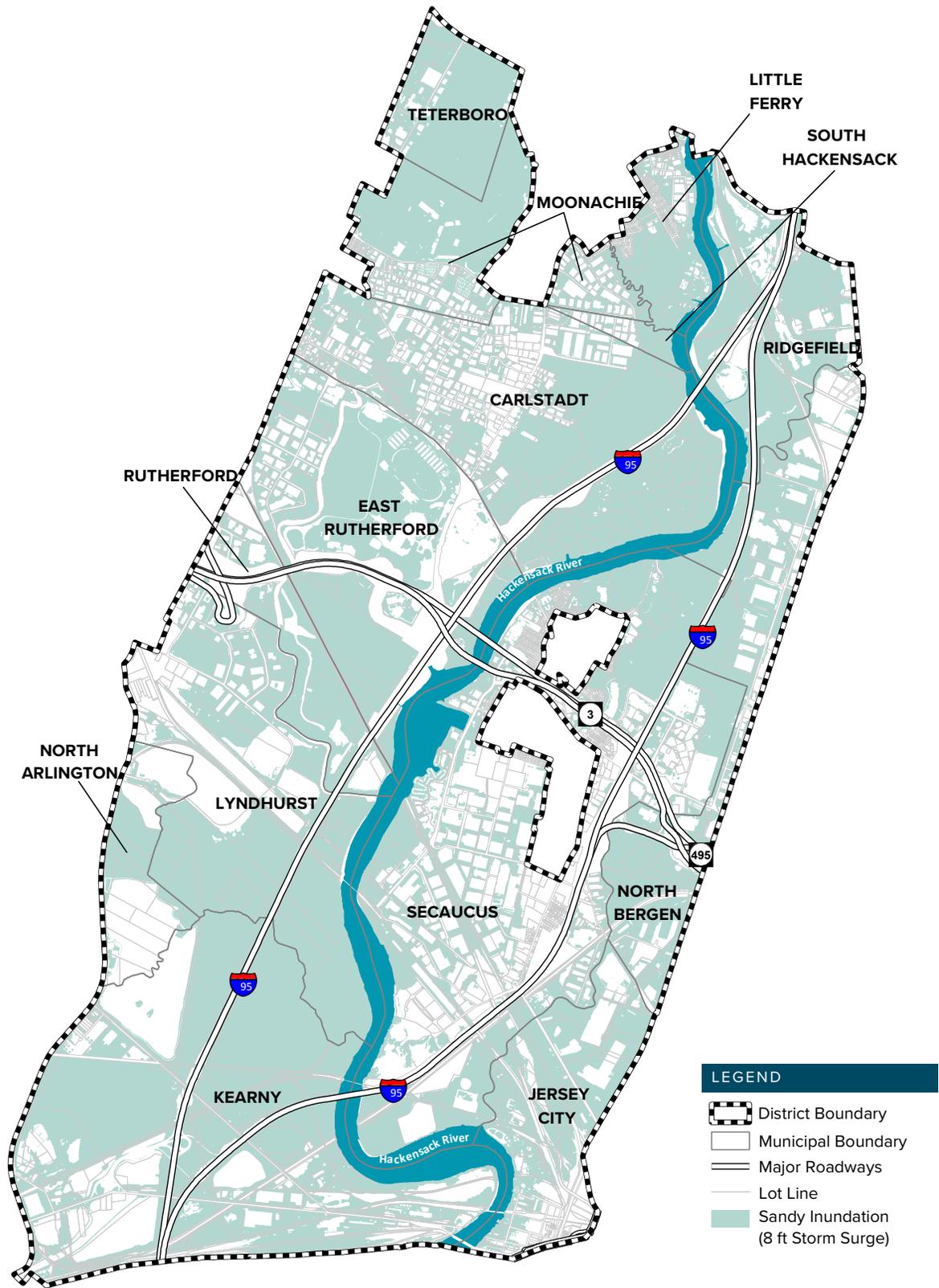


Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 17: SUPERSTORM SANDY INUNDATION (2012)



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



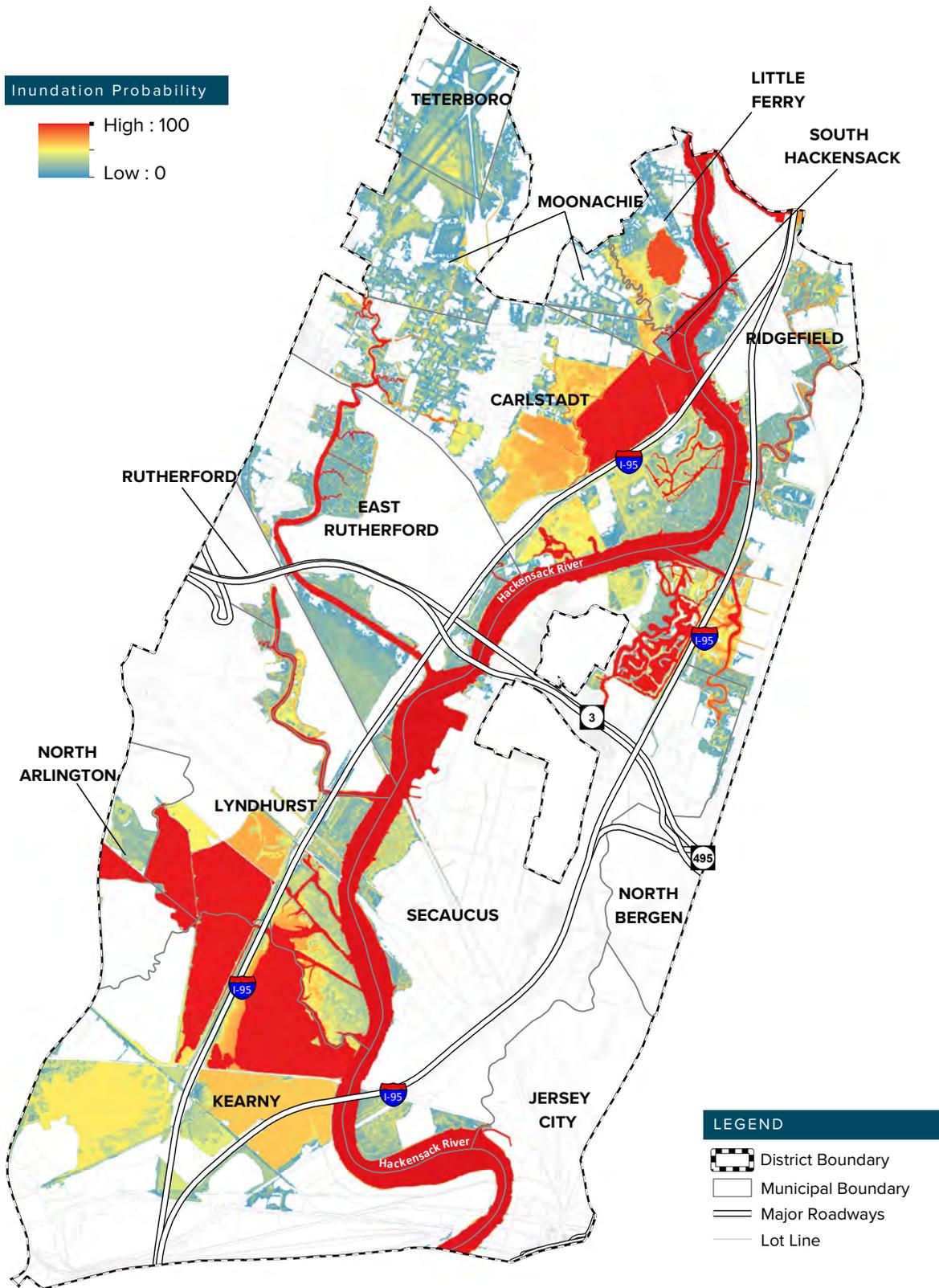
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(s): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 17 – SUPERSTORM SANDY INUNDATION (2012)

MAP 18: INUNDATION FOOTPRINT IN 2050 (2FT SEA LEVEL RISE PROJECTION)



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



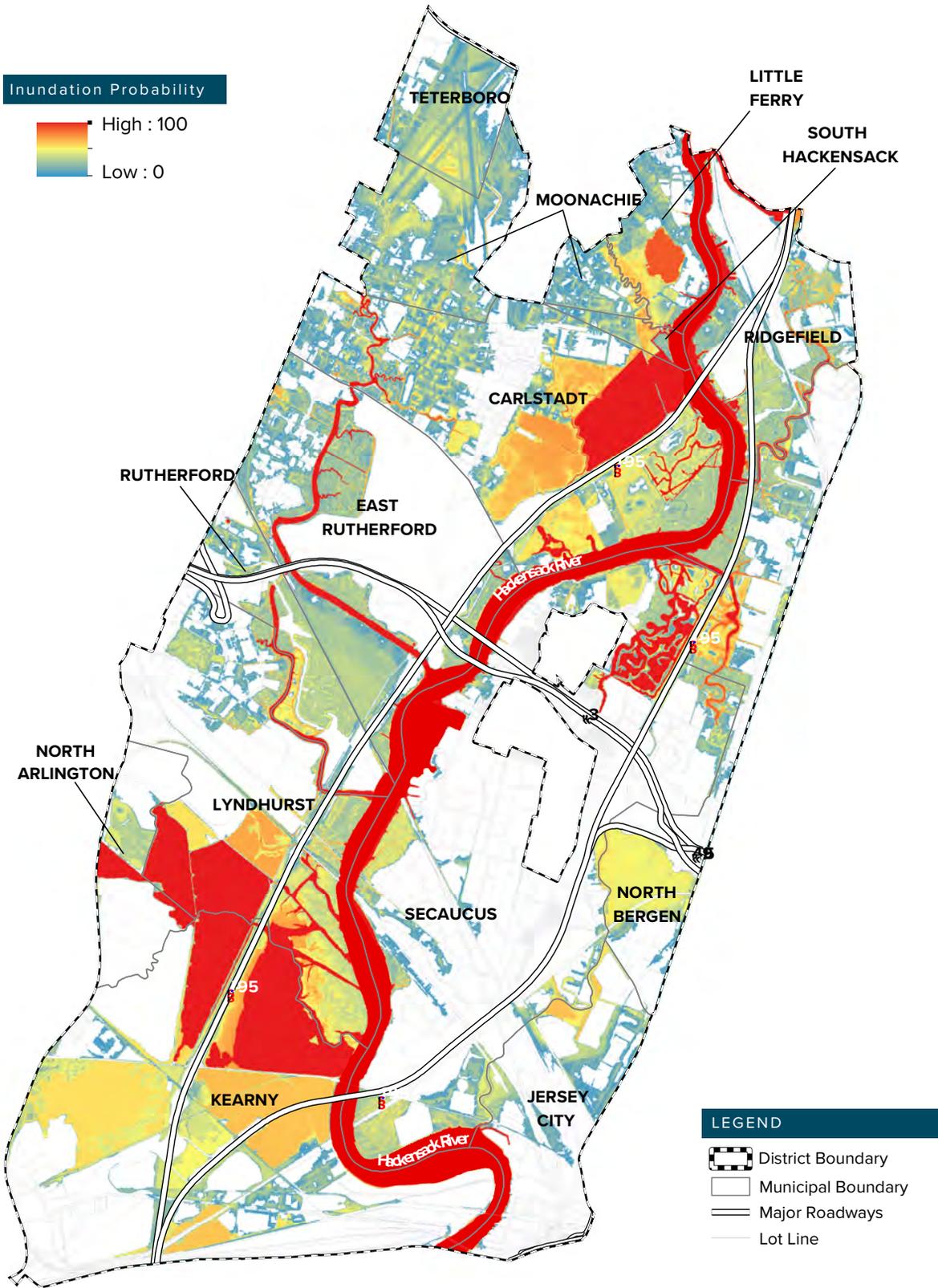
Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 18 – INUNDATION FOOTPRINT IN 2050 (2FT SEA LEVEL RISE PROJECTION)

MAP 19: INUNDATION FOOTPRINT IN 2100 (3FT SEA LEVEL RISE PROJECTION)



SCALE:
0 900 1,800 3,600 5,400 7,200
1 inch = 3,500 Feet



Units: US Survey Feet
Datum: North American Datum 1983
Coordinate System: NJ State Plane
Data Source(S): MERI, NJDEP, NJDOT



DISCLAIMER:
This map was created using MERI Geographic Information System digital data. The information provided on this map is provided "as is" with no warranty of any kind. This is neither an official state map nor state authorized; it is for information and presentation purposes only.

MAP 19 – INUNDATION FOOTPRINT IN 2100 (3FT SEA LEVEL RISE PROJECTION)



PHOTO COURTESY OF JOE KOSCIELNY



NEW JERSEY SPORTS & EXPOSITION AUTHORITY

1 DeKorte Park Plaza Lyndhurst, NJ 07071 | www.njsea.com