RESILIENT NJ: Burlington County Route 130 Corridor

MULTI-MUNICIPAL CLIMATE CHANGE-RELATED HAZARD VULNERABILITY ASSESSMENT

APRIL 2026







Dewberry

InGroup Inc.

Environmental Resolutions, Inc.
Engineers · Planners · Hydrogeologists · Surveyors

Burlington County 1694 New Jersey

New Jersey Department of Environmental Protection

RESILIENT NJ

PREPARED FOR

New Jersey Department of Environmental Protection

Burlington County, New Jersey

TABLE OF CONTENTS

SECTION 1: Introduction 1

SECTION 2: Stakeholder Engagement 7

SECTION 3: Vulnerability Assessment 13

SECTION 4: Planning Analysis. 30

SECTION 5: Resilience Strategy. 34

SECTION 6: CCRHVAs for each Municipality. 36

Section 6.1: Beverly City CCRHVA 37
Section 6.2: Burlington City CCRHVA 78
Section 6.3: Burlington Township CCRHVA 121
Section 6.4: Cinnaminson Township CCRHVA. 163
Section 6.5: Delran Township CCRHVA 202
Section 6.6: Edgewater Park Township CCRHVA 241
Section 6.7: Florence Township CCRHVA. 282
Section 6.8: Palmyra Borough CCRHVA 318
Section 6.9: Riverside Township CCRHVA 356
Section 6.10: Riverton Borough CCRHVA 395
Section 6.11: Willingboro Township CCRHVA 433

SECTION 7: Conclusion. 472

References and Endnotes 475

This work was made possible with financial assistance from the Coastal Zone Management Act of 1972, as amended, administered by the Office for Coastal Management, National Oceanic and Atmospheric Administration (NOAA) through the New Jersey Department of Environmental Protection, Coastal Management Program and Resilient NJ program. The assessments, data, and actions in this plan (or document) do not represent guidance or policy of NJDEP and does not replace the need for regulatory review by the appropriate local, state, and federal agencies.

Acronym List

ACS	American Community Survey
AEP	Annual Exceedance Probability
BMP	Best Management Practice
CCRHVA	Climate Change-Related Hazard Vulnerability Assessment
CIP	Capital Improvement Plans
CRS	Community Rating System
CVA	Coastal Vulnerability Assessment
CVI	Coastal Vulnerability Index
DCA	Department of Community Affairs
DVRPC	Delaware Valley Regional Planning Commission
EAL	Expected Annual Loss
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HEFSP	Housing Element and Fair Share Plans
HMP	Hazard Mitigation Plan
MHHW	Mean Higher High Water
MLUL	Municipal Land Use Law
NFHL	National Flood Hazard Layer
NJDEP	New Jersey Department of Environmental Protection
NJOEM	New Jersey Office of Emergency Management
NJDOT	New Jersey Department of Transportation
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRI	National Risk Index
OEM	Office of Emergency Management
SLR	Sea Level Rise
SSURGO	Soil Survey Geographic Database
STAP	Science and Technical Advisory Panel
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USGS	United States Geological Survey

Acknowledgments

The project team wishes to thank the local mayors, governing bodies and local officials who helped facilitate the study. We appreciate the time, attention, and insight of the following individuals without which this document would not be possible:

Beverly City

- Mayor Cynthia Hall Miller
- Administrator Rich Wolbert
- Municipal Clerk Jessica Bolen
- Land Use Board Secretary Natalie Lewis
- Beverly City Common Council

Burlington City

- Mayor Barry Conaway
- Business Administrator Johanna Conyer
- Planning Board Secretary Jamie Pennacchi
- Engineer William H. Kirchner

Burlington Township

- Mayor E.L. "Pete" Green
- Administrator Jodi M. Botlinger
- Township Engineer Scott Hatfield

Cinnaminson Township

- Mayor Ryan Horner
- Administrator Eric Schubiger
- Planning Board Secretary Beverly Russell
- Previous: Mayor Stephanie Kravil

Delran Township

- Mayor Barnes Hutchins
- Administrator Jamey Eggers
- Administrative Secretary Kimberly Bogie
- Planning Board Secretary Colleen Kohn

Edgewater Park Township

- Mayor Sarah Cannon-Moye
- Administrator Tom Pullion
- Planning Board Secretary Patricia Cahall
- Previous: Mayor Juanita Scott
- Previous: Mayor Jeffrey Daloisio

Florence Township

- Mayor Kristan Marter
- Administrator Thomas A. Sahol
- Planning Board Secretary Anne-Marie Hellmann

Palmyra Borough Township

- Mayor Gina Ragomo Tait
- Administrator John Gural
- Planning Board Secretary Doretha (Rita) Jackson

Riverside Township

- Mayor Gary Haman
- Administrator Meghan Jack

Riverton Borough

- Mayor Jim Quinn
- Borough Clerk Michelle Hack

Willingboro Township

- Mayor Samantha Whitfield
- Manager Dwayne Harris
- Planning Board Secretary Donald St. Hillaire

Burlington County Board of Commissioners

- Dr. Felicia Hopson, Director
- Allison Eckel, Deputy Director
- Randy Brolo, Commissioner
- Tyler J. Burrell, Commissioner
- Tom Pullion, Commissioner

Burlington County Department of Public Works/ Division of Engineering

- Burlington County Department of Public Works/Division of Engineering
- Joseph T. Brickley, Director of Public Works/County Engineer
- Tom J. Stanuikynas, Supervising Planner

The Project Team also wishes to thank all those who live, work, and visit the 11 municipalities whose participation in the in-person and on-line engagement events enabled the creation of this document.



FIGURE 0.1: View north along Route 130 at Beverly Rd in Burlington Township. *(Source: Famartin, Wikimedia Commons, CC-BY-SA-4.0)*

SECTION 1: Introduction

Background

Program Overview

The New Jersey Department of Environmental Protection's (NJDEP) Resilient NJ program is designed to address climate change-related hazards (including increasing temperatures, drought, flooding, hurricanes, and sea level rise). Resilient NJ aims to make communities stronger and more prepared through community-based resiliency planning. Resilient NJ is a community-focused approach to engage, equip, and empower communities with information they need to make climate-informed decisions for their present and their future.

As part of Resilient NJ, NJDEP, in partnership with Burlington County and 11 municipalities along the Route 130 corridor, has created this document, a multi-municipal Climate Change-Related Hazard Vulnerability Assessment (CCRHVA). This effort will lay the groundwork to meet the requirements of the Municipal Land Use Law (MLUL), discussed below) in which municipalities are to incorporate a climate change related hazard vulnerability assessment into any new land use plan element of the municipal master plan. This planning effort began in December 2024 and ended in April 2026.

What is a Climate Change-Related Hazard Vulnerability Assessment?

Recognizing the need to incorporate climate change into local land use decisions, on February 4, 2021, Governor Murphy signed into law P.L. 2021, c6, which amends the MLUL and introduced the CCRHVA. Through this amendment, municipalities must incorporate a CCRHVA into any Master Plan Land Use Element adopted after the signing. CCRHVAs must identify critical facilities and natural and manmade infrastructure, analyze the impact of current and future hazards (including but not limited to extreme weather, temperature, drought, fire, flooding, and sea level rise) on critical facilities, natural infrastructure, and other systems, include a build-out analysis of future residential, commercial, industrial, and other developments in the municipality, develop resilience actions to mitigate reasonably anticipated natural hazards, and a policy statement.

This document contains 11 municipal CCRHVAs (**Section 6**). These municipal CCRHVAs can be incorporated by the individual municipalities into the land use element of their master plans to satisfy MLUL requirements. They are written to meet Plan Endorsement Guidelines and the requirements of P.L. 2021, c.6.

MLUL REQUIREMENTS FOR THE CCRHVAS:[1]

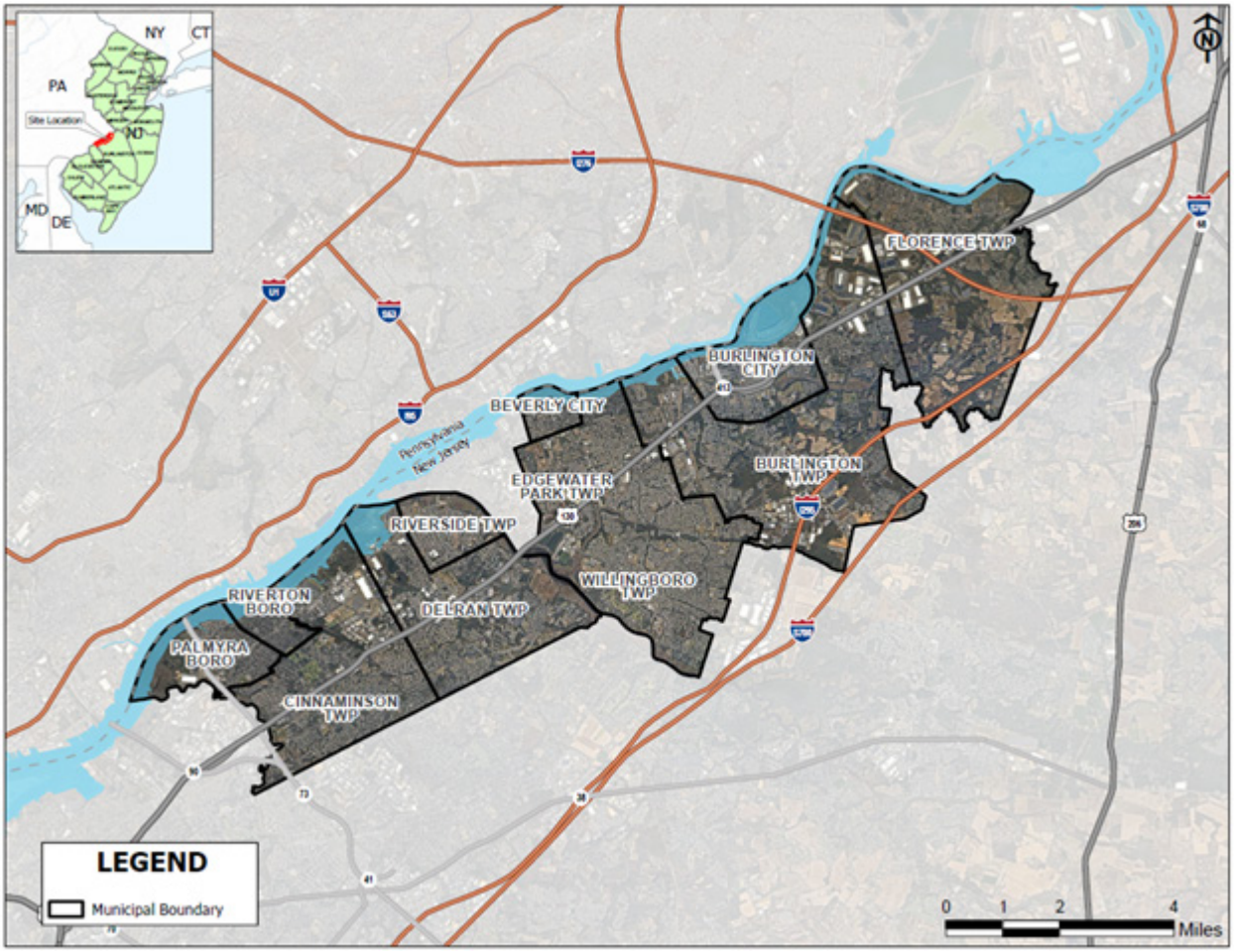
- Analyze **current and future threats** to, and **vulnerabilities** of, the municipality associated with climate change-related natural hazards;
- Include a **build-out analysis** of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities identified above related to that development;
- Identify **critical facilities, utilities, roadways, and other infrastructure** that is necessary for evacuation purposes and sustaining quality of life during a natural disaster, to be maintained at all times in an operational state;
- Analyze the potential impact of **natural hazards** on relevant components and elements of the master plan;
- Provide **strategies and design standards** that may be implemented to reduce or avoid risks associated with natural hazards;
- Include a **specific policy statement** on the consistency, coordination, and integration of the climate-change related hazard vulnerability assessment with certain other plans adopted by the municipality; and
- Rely on the most recent natural hazard projections and **best available science** provided by the New Jersey DEP.

The Municipalities in the Study Area

The Route 130 corridor is located in Burlington County, in the south-west area of the State, on the New Jersey side of the Delaware River. The corridor spans 11 municipalities: Florence Township, Burlington City, Burlington Township, Willingboro Township, Edgewater Park Township, Beverly City, Riverside Township, Delran Township, Riverton Borough, Cinnaminson Township, and Palmyra Borough. Some of these communities are directly adjacent to the Delaware River while others are inland. **Figure 1.1** shows a map of the corridor and the communities.

The corridor's development patterns range from historic downtowns, to suburbs, to less dense and more rural areas. In addition to Route 130, the area is served by NJ Transit's River LINE light rail (which runs from Trenton to Camden) and the BURLink shuttle system. The corridor is home to a diverse population, including sizable communities of Portuguese and Turkish speakers as well as significant African American and Latino populations in Willingboro.

FIGURE 1.1: Map of the 11 communities in the Study Area.



The municipalities contained in the Route 130 Corridor represent a combined population of 143,480 people based on the 2023 American Community Survey (ACS). **Table 1.1** shows the vulnerable populations in the combined corridor area, compared with the State of New Jersey, which has a total population of 9,267,014. Values are that are higher than the State percentages are **bolded**. In particular, the Study Area has a higher population of those 65 or older and a higher population of individuals with disabilities than the State.

Climate Change Impacts in the Region

Climate change is already affecting New Jersey and is expected to increasingly influence how residents live, work, travel, and interact with their environment. These impacts are wide-ranging, from changes in agricultural productivity and air quality to more intense storms and increased flooding.[2] Understanding these evolving risks is essential for communities across the state as they plan for the future.

TABLE 1.1: Socially Vulnerable Populations.

DEMOGRAPHIC VARIABLE	ROUTE 130 CORRIDOR	% OF POPULATION	STATE OF NEW JERSEY	% OF POPULATION
Population 18 or Younger	30,170	21.03%	2,031,322	21.90%
Population 65 or Older	24,318	**16.95%**	1,559,816	16.83%
Population with a disability	18,600	**13.07%**	975,308	10.60%
Persons without a high school diploma	7,281	7.14%	600,736	9.30%
Persons below poverty	19,989	14.03%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	**6.57%**	N/A*	6.20%
Persons uninsured	8,519	5.99%	682,266	7.40%
Persons who speak English "less than well"	3,946	2.93%	562,865	6.44%
Single Parent households	3,378	**6.36%**	198,943	5.72%
Minority Ethnicity (non-white)	72,305	**50.39%**	4,453,673	48.06%
Mobile homes	53	0.09%	35,303	0.90%
Housing with 10 or more units	5,333	9.51%	639,960	16.95%
Crowded housing units	945	1.78%	129,710	3.73%
Households with no vehicle	2,652	4.99%	391,842	11.30%

* *Source data excluded numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Across the State, climate change impacts may include more frequent and longer heat waves; more intense and frequent precipitation events; increased flooding and drought; stronger tropical storms; sea-level rise and more frequent “sunny day flooding”; increased air pollution; stressed drinking water supplies; heightened wildfire risk; and agricultural impacts driven by changing temperature and rainfall patterns.[3] These impacts do not affect all residents equally.

NJDEP recognizes that certain populations are particularly vulnerable to climate change-related hazards. As NJDEP notes, "Children, older adults, and individuals with disabilities are more likely to be vulnerable."

SOCIALLY VULNERABLE POPULATIONS:[7]

- Children and older adults can face emotional trauma caused by natural hazard and extreme weather events. This can impair a child’s cognitive and emotional development as well as their overall mental health.
- Older adults may also have impaired mobility and may need assistance in evacuation, especially if they are living in an assisted living facility or nursing home.
- Individuals with disabilities may require assistance in evacuation for themselves and any necessary medical equipment.

The municipalities in the Study Area, many of which are located along the tidally influenced Delaware River, are already experiencing climate-related impacts similar to those observed statewide. These communities have faced increasing temperatures, more frequent severe storms, and recurring flooding. Historic events affecting the area include the 1955 flood, Tropical Storm Lee, Hurricane Irene, and Superstorm Sandy. According to Burlington County's 2019 Hazard Mitigation Plan (HMP), municipalities in the County are susceptible to multiple types of flooding, including tidal flooding, riverine flooding, and shallow flooding caused by high precipitation rates, poor drainage, extremely high tides, and hurricane and tropical storm activity.[4]

Local and regional studies further illustrate these challenges. The Delaware Valley Regional Planning Commission's Burlington City, NJ Coastal Vulnerability Assessment Report documented roadway flooding and transportation disruptions during Hurricanes Irene and Lee, including closures along major routes and connections to the Burlington–Bristol Bridge.[5] The County's HMP also identifies several municipalities along the Route 130 Corridor as particularly vulnerable to flooding and flash flooding associated with the Delaware River, sea-level rise, and coastal flooding. For example, Delran faces elevated flood risk due to upstream flooding, drainage limitations, and erosion-prone culverted tributaries, while the City of Beverly has critical facilities and evacuation routes that are vulnerable to riverine flooding.[6]

Although many of these impacts are already being experienced, there are meaningful opportunities to reduce risk and increase preparedness. By understanding current and future climate-related hazards and identifying locally appropriate resilience actions, municipalities can better protect residents, infrastructure, and essential services. This assessment was undertaken to support that goal by providing a consistent, data-driven understanding of climate change impacts across the Study Area and informing community-led resilience planning efforts.

Study Process

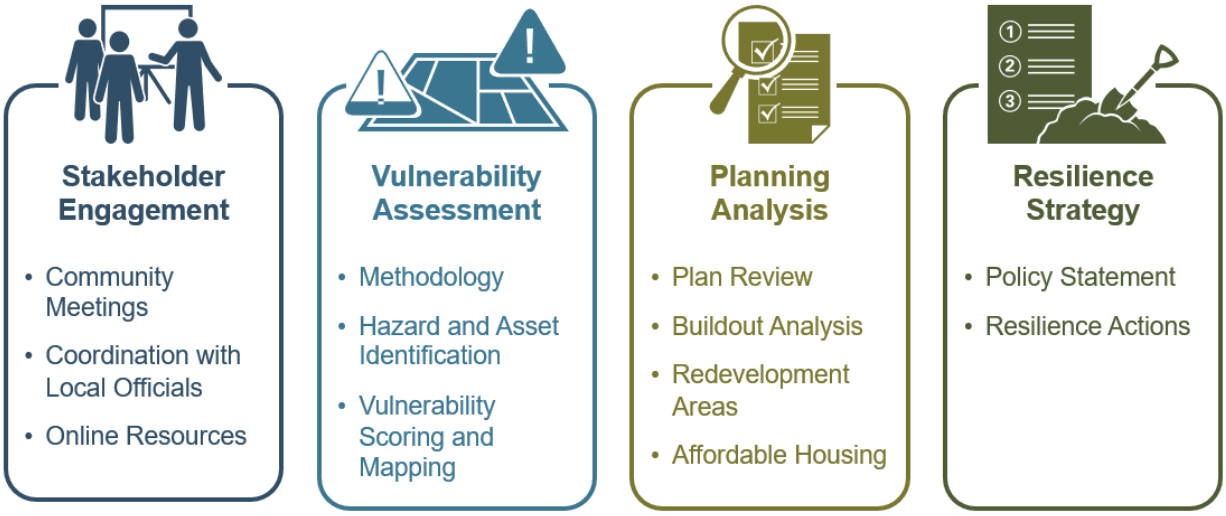
The CCRHVA process integrated local stakeholder participation, research, and technical analysis to yield local insights and actionable strategies. The study process, illustrated in **Figure 1.2**, included the following core components:

- **Stakeholder Engagement:** Meetings and coordinated input from elected officials, regional and local government staff, and members of the general public allowed the project team to better understand local concerns and priorities, and helped tailor project outcomes to meet community needs.
- **Vulnerability Assessment:** The project team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards. The resulting data drove the presentation of impact statistics, narratives, and identification of focus areas to target mitigation action.
- **Planning Analysis:** The project team examined each municipality's plans and policies—including existing municipal plans, zoning and development policy, redevelopment areas, and affordable housing obligations—that affect and shape future development through the lens of climate-related hazards and risk.

- **Resilience Strategy:** Weaving together insights from stakeholder engagement, vulnerability assessment, and planning analysis, a unique policy statement and tailored set of resilience actions were developed for each municipality. These actions include both physical projects and policy and planning-related activities.

Each of these components of the Study Process are described in more detail below. Municipality-specific results, findings, and details are included in **Section 6**.

FIGURE 1.2: CCRHVA Study Process



SECTION 2: Stakeholder Engagement

Stakeholder engagement was a core component of the CCRHVA. Engagement activities were designed to understand how climate change impacts are experienced locally, identify community priorities and critical assets, and inform the development of practical and equitable resilience actions. Engagement occurred throughout the project and included outreach to members of the public, municipal officials and staff, and other stakeholders through a combination of in-person meetings, virtual meetings, and online tools. A summary of engagement findings specific to each municipality is provided in **Section 6**.

Public Outreach

Public outreach combined in-person and virtual engagement opportunities held in spring and summer 2025. Three in-person community meetings were held in April 2025 and hosted by Burlington Township, Willingboro, and Delran, with each meeting serving multiple nearby municipalities along the Route 130 Corridor. These meetings were designed as interactive community visioning sessions to understand how residents experience climate change impacts, identify vulnerable locations and valued community assets, and discuss priorities for resilience at both the municipal and corridor scales.

To support inclusive participation, meeting notices were translated into multiple languages, including Spanish, Portuguese, and Turkish, and included information on how to request additional translation services. Public meetings were advertised through NJDEP, Burlington County, and the 11 participating municipalities to reach a broad cross-section of residents.

FIGURE 2.1: Community meeting flyer.

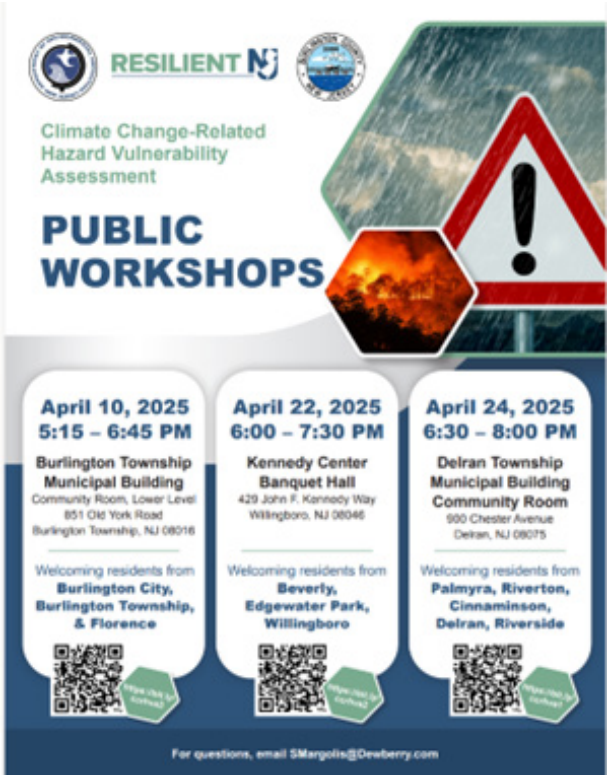


FIGURE 2.2: Stakeholder meeting in Delran (April 24, 2025).



Meetings were organized around topic-based stations focused on climate concerns, problem area identification, community asset identification, and resilience visioning. Participants could engage at multiple stations, provide written comments during the meetings, and submit additional feedback afterward using QR codes. A total of 61 stakeholders attended the in-person meetings, including residents, elected officials, and municipal committee members.

Key findings from in-person outreach consistently identified flooding as the most significant and disruptive climate concern. Participants highlighted recurring roadway flooding, poor drainage, overflowing and clogged catch basins, stormwater runoff, and flooding associated with the Delaware River. Many comments focused on locations where flooding regularly impedes daily travel, damages property, or creates safety hazards. Pollution and debris carried by floodwaters, erosion along waterways, and ecological degradation were also frequently noted.

In addition to flooding, participants raised concerns about extreme heat and urban heat islands, drought and water availability, wildfires, food insecurity, mosquito-borne illness associated with standing water, and financial strain related to flood insurance and unfunded floodplain requirements. These concerns emphasized the interconnected social, environmental, and economic dimensions of climate change impacts.

When identifying critical community assets, participants most frequently cited police, fire, and emergency medical services facilities, followed by schools, parks and recreation areas, commercial districts,

historic resources, transportation corridors, bridges, and hospitals. While many of these assets aligned with those evaluated in the vulnerability assessment, residents also emphasized homes and residential neighborhoods as critical assets due to their importance to personal safety and household stability.

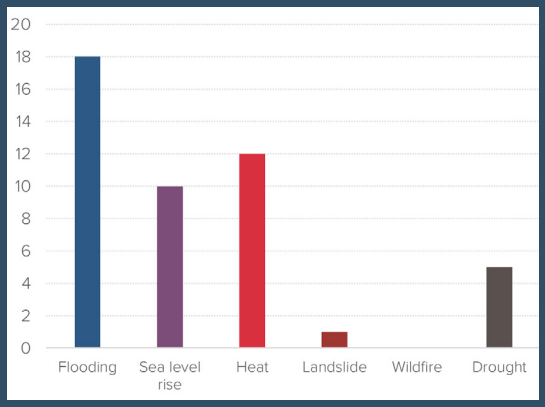
A virtual public meeting was held on July 30, 2025, to share draft vulnerability assessment findings and gather feedback on adaptation priorities. Twenty-five stakeholders attended the meeting. Interactive polling reinforced themes identified during in-person outreach. Flooding was identified as the most concerning hazard by 90% of respondents, followed by extreme heat (60%) and sea-level rise (50%). Respondents expressed a strong preference for investing in actions that protect critical infrastructure, with 68% ranking this as a top priority.

Polling also revealed preferences for the types of resilience actions pursued. Large-scale community projects—such as major stormwater or infrastructure improvements—were selected as the top priority by 44% of respondents, followed by programmatic actions and partnerships (33%). When asked about secondary benefits of resilience actions, respondents most frequently prioritized improved public infrastructure (29%), followed by support for vulnerable populations and natural resource preservation (each at 24%).

Overall, public outreach findings emphasized that residents are most concerned about frequent, visible, and disruptive flooding; value investments that protect essential services and neighborhoods; and support resilience strategies that deliver both direct risk reduction and broader community benefits.

COMMUNITY FEEDBACK

In the July public meeting, residents were asked: "Which hazard(s) do you think are the most concerning and important to address based on your lived experience and this presentation (choose up to 3)?" Flooding was identified by 18 residents as the top concern.



Residents were also asked what stood out to them as notable or surprising about the analysis. Responses included:

Flooding and sea level rise threatening critical infrastructure are most important to me

I'm surprised that drought wasn't rated as a higher threat

[Landslide] was surprising in Burlington. Flooding and sea level rise was always the elephant in the room

Engagement with Local Officials

Municipal officials—including administrators, mayors, engineers, planners, public works staff, and planning board representatives—were engaged throughout the CCRHVA process to ensure that the assessment reflected on-the-ground conditions, implementation realities, and municipal priorities. Engagement with local officials began with a virtual briefing in February 2025 and continued through regular email coordination and three structured virtual meetings held in June, July, and October 2025.

At the June 2025 meeting, the Project Team shared summaries of public input from the in-person community meetings and gathered additional feedback from officials on known problem areas, critical facilities, and resilience goals. Officials helped validate locations identified by residents as flood-prone and provided additional context regarding infrastructure constraints, maintenance challenges, and jurisdictional responsibilities. Early versions of the interactive vulnerability maps were also shared, prompting discussion about local drainage patterns, historic flooding behavior, and infrastructure assets not fully captured in available datasets.

At the July 2025 meeting, draft vulnerability assessment results were presented, and officials reviewed preliminary policy concepts and potential resilience actions. Officials provided detailed feedback on feasibility, cost, and implementation barriers, emphasizing the importance of aligning recommended actions with existing capital improvement plans, staffing capacity, and regulatory authority. Discussions highlighted the need for flexibility in action framing, recognizing variation in municipal size, resources, and administrative capacity.

At the October 2025 meeting, vulnerability findings were revisited and resilience actions were further refined and developed collaboratively. Officials helped prioritize actions, identify responsible parties, flag permitting and coordination requirements, and suggest potential funding sources. This input directly informed the final set of community-specific and collaborative resilience actions included in each municipal CCRHVA.

Several key themes emerged through engagement with local officials. First, officials emphasized the importance of regional awareness and coordination. Given the project's focus on 11 municipalities along the Route 130 Corridor, officials repeatedly noted that climate hazards—particularly flooding and stormwater—do not respect municipal boundaries. Participants shared examples where infrastructure upgrades in one municipality, such as upsizing culverts, could unintentionally increase downstream flooding in neighboring communities. Conversely, officials also highlighted instances where coordinated or upstream investments reduced flooding impacts for multiple municipalities.

Second, officials underscored the challenges associated with implementing resilience actions. Many critical infrastructure systems, particularly stormwater conveyance systems, were constructed decades ago and were not designed for current or future rainfall conditions. While improvements such as replacing culverts or increasing pipe capacity are often identified as necessary, these actions typically require roadway reconstruction, utility coordination, and significant financial investment. As a result, resilience progress may appear slow to the public even when municipalities are actively planning or pursuing solutions.

Third, officials identified funding constraints and administrative capacity as major barriers. Limited municipal budgets, competing priorities, and the complexity of securing state and federal funding were frequently cited. Officials emphasized the importance of identifying multiple funding pathways and aligning resilience actions with existing programs, such as hazard mitigation grants and state-led buyout initiatives. These considerations informed how resilience actions were framed in the CCRHVAs, including the inclusion of estimated costs, potential funding sources, and phased implementation timelines.

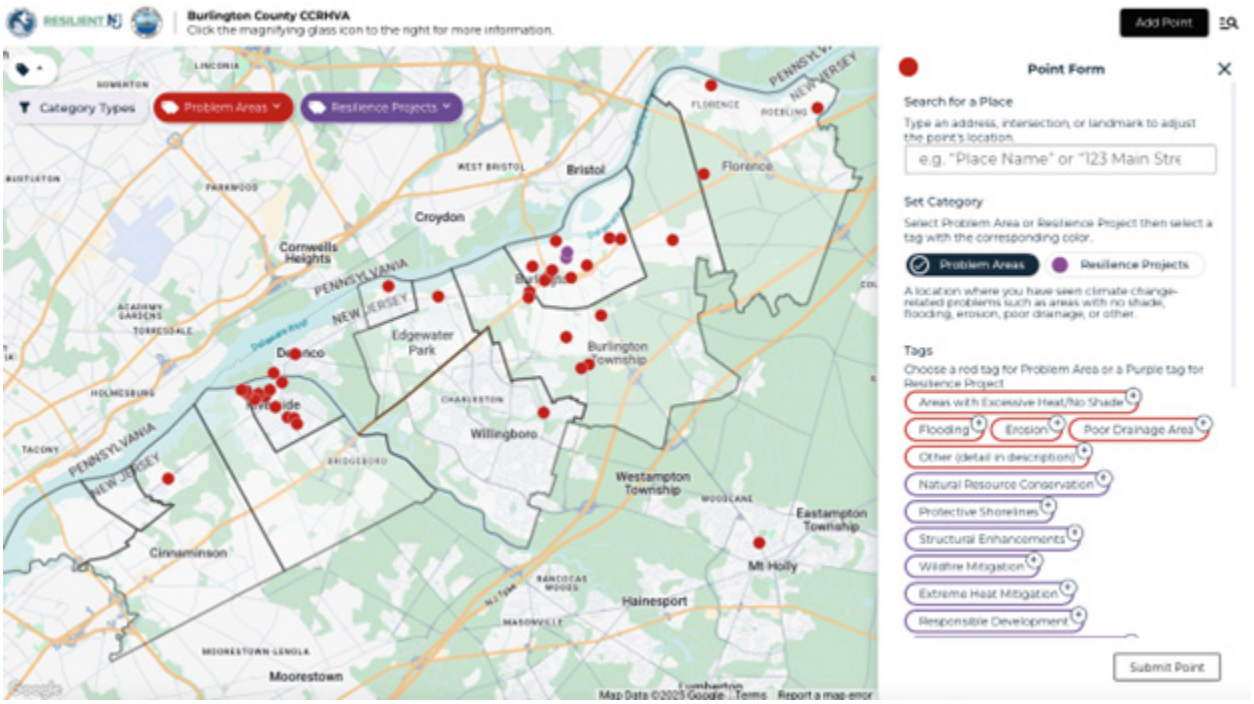
Online Resources

Online engagement tools were developed to broaden participation and allow stakeholders to provide input outside of scheduled meetings. Burlington County hosted a project website that served as a central hub for information about the CCRHVA, including the purpose of the project, background materials, updates, and opportunities for public involvement.

To supplement in-person outreach, the Project Team developed a participatory online mapping tool that allowed users to identify climate-related problem areas and suggest locations for resilience projects. Users could identify locations on an interactive map, describe issues or opportunities, and assign categories and tags (**Figure 2.3**). An online comment form using the same questions as the in-person meetings was also made available.

The mapping tool and comment form were accessible between May 22 and June 30, 2025, and were promoted through the project website and municipal administrators. During this period, the mapping tool collected comments on 36 map points and an additional 12 comment forms were submitted, resulting

FIGURE 2.3: Screenshot of online mapping tool with community input.



HIGHLIGHTS OF INPUT

- **Concerns About Climate Change**: Participants noted flooding, stormwater management, sea level rise, storm frequency and intensity, over-development, unfunded mandates for flood zones, standing water and mosquito borne illness, heat islands, and extreme temperature changes as concerns about climate change.
- **Problem Identification**: Flooding was the most common theme from commenters. Additionally, commenters noted issues including poor drainage, heat, wind, ice, erosion, and drought.
- **Asset Identification**: Commenters identified community assets to include historic buildings and districts, homes, waterfront promenade, tree canopy, municipal infrastructure, parks, roads, bridges, and hospitals.
- **Resilience Visioning**: Commenters envisioned resiliency to include better stormwater management, emergency preparedness, and coordination among all levels of government.

in a total of 123 individual inputs. These submissions reinforced themes identified during meetings—particularly concerns related to flooding, drainage, heat, and infrastructure—and helped refine the identification of vulnerable areas and potential resilience actions.

SECTION 3: Vulnerability Assessment

Vulnerability refers to the extent to which people, places, systems, or things are prone to, or are unable to cope with, the adverse impacts of climate change. Vulnerability is comprised of exposure, sensitivity, and adaptive capacity. This vulnerability assessment combines these three elements to evaluate how climate change will affect an identified population, place, or system.

The basic methodology for this study's vulnerability assessment is provided below, and details on results for each municipality are provided in **Section 6**.

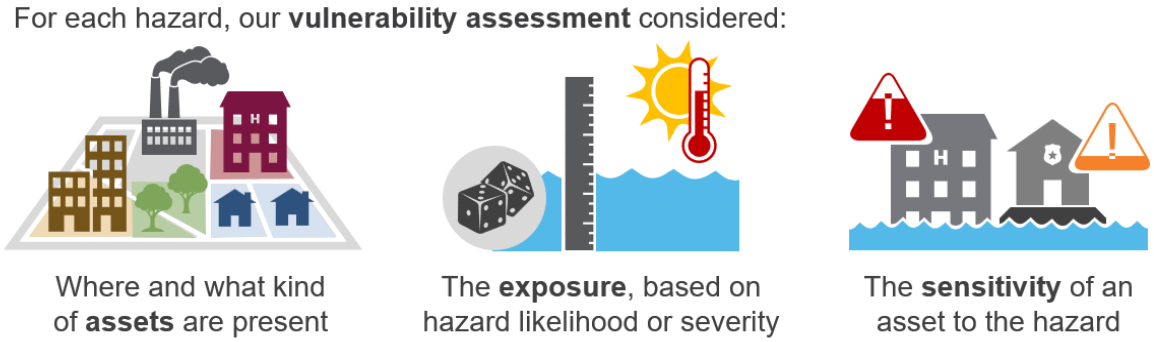
The vulnerability assessment started by reviewing and collecting relevant data, including a review of asset and hazard data available and applicable to this study. Next, to assess climate vulnerability across each community, the potential effects of each hazard were evaluated for all mapped assets. As illustrated in **Figure 3.1**, each asset was evaluated based on two factors, hazard exposure and sensitivity, and then those results were compiled into summaries for the community.

Exposure: The degree to which a climate variation or change may affect people, places, or systems.

Sensitivity: The degree to which people, places, or systems could be harmed by that exposure.

Adaptive Capacity: The degree to which people, places, or systems could mitigate the potential for harm by taking action to reduce exposure or sensitivity.

FIGURE 3.1: Key factors of the vulnerability assessment.



Assets and Themes

For this study, assets are anything of value that may be at risk of impacts from climate change-related hazards and events. This includes anything from buildings, to parks, to electrical infrastructure, to residential communities themselves. Collecting information on the location and characteristics of assets in the Study Area was an important initial step in the vulnerability assessment, as it helps to define what is potentially at risk, and lays a foundation for quantitatively assessing that risk.

More than 40 kinds of assets were identified and mapped in the Study Area. Most assets reviewed were from State and Federal resources, including the NJDEP Bureau of GIS, the New Jersey Office of GIS, NJ Geographic Information Network, Burlington County Department of GIS, the U.S. Census Bureau, USGS, and NOAA. Assets were consolidated into 11 primary types and grouped into four themes for analysis: Community resources, critical infrastructure, natural infrastructure, and social fabric. Below is a description of each theme and definitions for the asset types in each theme.

Community Resources assets include residential buildings, non-residential buildings, agricultural lands, and preserved farmland. These types of assets are vital to the well-being of communities, providing housing, essential services, and economic value.



Residential Buildings: Buildings on parcels with apartment or residential classification.



Public & Commercial Buildings: Buildings on parcels with commercial, industrial, public, or other classification type. Commercial uses include hardware stores, grocery stores, pharmacies, doctor's offices and other community services.



Agricultural Lands: Area where land use and land cover is classified as agriculture, including cropland, pastureland, orchards, and livestock.

Critical Infrastructure includes assets that relate to transportation routes (including evacuation routes), utility infrastructure, health and emergency services, and hazardous material sites. These infrastructure networks support all facets of daily life and are considered essential to the smooth functioning and safety of communities.



Transportation Routes: Linear assets that include roadways and railways.



Utility Infrastructure: Point location of infrastructure assets related to energy, water, and communication systems.



Health & Emergency Services: Point location of infrastructure assets, including fire and EMS stations, hospitals, law enforcement, and emergency shelters.



Hazardous Material Sites: Point locations of sites with toxic substances with the potential to cause environmental concern.

Natural Infrastructure assets include wetlands, forests, shrubland, and designated wildlife habitat areas. These support the ecological health of the community and surrounding environments and provide ecosystem services to community residents, including supplying natural resources, habitat, and recreation opportunities.



Wetlands: Area where land use and land cover are classified as coastal or interior wetlands.



Forests & Shrubland: Area where land use and land cover are classified as coniferous forest, deciduous forest, or brushland/ shrubland.



Wildlife Habitat Areas: Areas designated as wildlife habitat cores and corridors.

Social Fabric refers to the population itself, and related asset data focuses on census tract-level population statistics. This information that identifies where people live and what demographic characteristics various neighborhoods share, with a focus on overburdened communities.



Residential Populations: Census tract-level index of social vulnerability in residential populations.

Hazards and Exposure

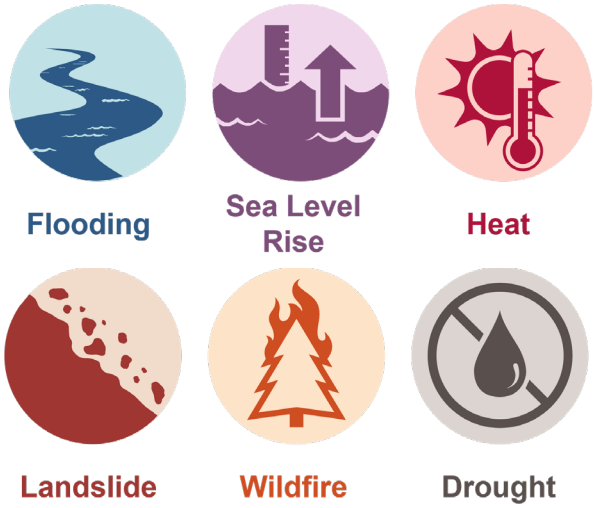
The Project Team identified climate-related hazards using three key sources: the Municipal Land Use Law (MLUL), guidance from Sustainable Jersey, and the Burlington County Hazard Mitigation Plan (HMP). The MLUL requires communities to consider five climate-related hazards: increasing temperatures, drought, flooding, hurricanes, and sea-level rise, as well as optional hazards such as landslides, extreme heat, and wildfires. Sustainable Jersey recommends evaluating additional hazards. Review of the County's HMP confirmed that landslides and wildfire are also relevant to the Study Area. Other hazards with uncertain or poorly understood climate change impacts were not included in this assessment and are addressed separately in the County's HMP. Other hazards considered but not ultimately included in the study were hurricanes, saltwater intrusion, ocean acidification, vector-borne disease, and ecological disease/agricultural pests.*

More than 60 data sources were reviewed to understand how these hazards affect the Study Area. Sources were prioritized based on how well they showed location-specific

* Other hazards considered but not ultimately included in the study were hurricanes, saltwater intrusion, ocean acidification, vector borne disease, and ecological disease/agricultural pests. Saltwater intrusion and ocean acidification were excluded due to minimal relevance to the Study Area. Vector-borne and ecological/agricultural diseases were excluded due to insufficient location-specific data. Hurricanes were not quantitatively analyzed because limited additional spatial data exist beyond flooding, sea-level rise, and temperature impacts.

impacts, whether they included both current and future conditions, their consistency with best available science from the New Jersey Department of Environmental Protection (NJDEP), and how recently they were updated. Based on this review, six hazards were selected for detailed, quantitative analysis: flooding, sea-level rise, extreme heat, landslides, wildfire, and drought (**Figure 3.2**).

FIGURE 3.2: Six hazards included in this assessment.



In this assessment, "exposure" describes how likely an asset is to be affected by a particular hazard at its location. Because each hazard behaves differently and is mapped using different data, exposure was defined separately for each hazard, considering either the likelihood or severity of the hazard occurring at that location. For each hazard, asset exposure scores reflect whether an asset is located in or exposed to mapped hazard areas or thresholds, with higher scores indicating greater potential for impact. The data sources and methods used for each hazard are described below.

Flooding

Flooding risks have increased over time as climate change has led to more frequent and intense storms. Flooding can be especially severe in developed areas, where drainage systems, limited open space, and paved surfaces make it harder for rainwater to soak into the ground. Severe flooding can damage property, disrupt critical services, and pose risks to public safety.

Flood hazard data for this study came from two primary sources: the Federal Emergency Management Agency's (FEMA) National Flood Hazard Layer (NFHL), accessed through NJDEP, and the New Jersey Design Flood Elevation dataset developed by Rutgers University. The Rutgers dataset builds on FEMA's mapped 1-percent annual chance flood (often called the "100-year flood") and adds three feet of elevation, consistent with NJDEP's 2023 Inland Flood Protection Rule, to account for increased rainfall under future climate conditions.

The FEMA flood maps used in this analysis reflect current conditions and were last updated in 2021; they do not include future climate projections. The Rutgers dataset also uses FEMA's 1-percent floodplain but expands it to include low-lying areas that may flood when water levels rise by an additional three feet, even if those areas are not directly connected to mapped floodplains.

Each asset's exposure to flooding was classified based on whether it is located in mapped flood hazard areas, with higher values representing greater flood exposure, as shown in **Table 3.1**.

TABLE 3.1: Flooding exposure score classifications.

EXPOSURE SCORE		DEFINITION
3	High	Asset is located within the present-day 1% annual exceedance probability (AEP) flood zone
2	Moderate	Asset is located within the present-day 0.2% AEP flood zone
1	Low	Asset is located within the expanded 1% AEP flood zone or low-lying areas affected by an additional 3 feet of water elevation
0	No Exposure	Asset is located outside of mapped floodplains



Sea Level Rise

Rising global temperatures are causing sea levels to increase as ocean water warms and expands, and land-based ice melts. Because the Delaware River is influenced by ocean tides, sea-level rise is an important consideration for this assessment. Rising water levels increase flooding along riverbanks and shorelines, and cause low-lying land to become more frequently or even permanently inundated.

Sea-level rise data were obtained from the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management's Sea Level Rise and Coastal Flooding Impacts Viewer, last updated in 2022. NOAA's model uses a simplified approach that estimates where water may spread based on elevation and hydrologic connections under higher tide conditions. The model does not account for factors such as shoreline erosion, land subsidence, or changes in river flow patterns.

The data show areas that could be inundated under sea-level rise increments ranging from 0 to 10 feet above current conditions, measured relative to mean higher high water levels around the year 2000. For this assessment, sea-level rise scenarios evaluated 1-foot increments from 0 to 5 feet. These values align with findings from the New Jersey Scientific Report on Climate Change, which projects that sea levels in the region could rise by more than 2 feet by mid-century and exceed 5 feet by the end of the century. Based on NOAA's local projections for the nearby Philadelphia area, these increments are consistent with an intermediate-high sea-level rise scenario. The regulatory flood elevation, the NJDEP Climate Adjusted Flood Elevation (CAFE), includes an additional four feet of water elevation, as these are tidal waters, to account for future climate conditions.

Table 3.2 shows the range of sea level rise scenarios plausible for the Study Area for present and future conditions. Sea level rise scenarios range to reflect uncertainty in how quickly global temperatures increase and how ice sheets, oceans, and local conditions respond. While the intermediate-high scenario is recommended for planning, considering both lower and higher scenarios may help communities prepare for a range of possible conditions.

Each asset's exposure to sea-level rise was scored based on the lowest amount of sea-level rise at which it becomes inundated, with higher scores indicating greater exposure, as shown in **Table 3.3**.

TABLE 3.2: Current and future sea level rise values across multiple sea level rise scenarios, compared to a 2020 baseline. Values are from Philadelphia, PA near the Study Area.

SEA LEVEL RISE SCENARIO	EXISTING CONDITIONS	FUTURE CONDITIONS			
	2020	2040	2060	2080	2100
Low	0.39 ft	0.85 ft	1.25 ft	1.54 ft	1.80 ft
Intermediate Low	0.43 ft	0.95 ft	1.44 ft	1.94 ft	2.40 ft
Intermediate	0.43 ft	0.98 ft	1.67 ft	2.56 ft	3.87 ft
Intermediate High	0.43 ft	1.08 ft	2.03 ft	3.35 ft	5.12 ft
High	0.43 ft	1.12 ft	2.33 ft	4.30 ft	6.59 ft

TABLE 3.3: Sea level rise exposure score classifications.

EXPOSURE SCORE		DEFINITION
6	Very High	Asset is exposed to inundation under current (0 ft) sea level conditions
5	High	Asset is exposed to inundation with 0–1 feet of sea level rise
4	Moderate-High	Asset is exposed to inundation with 1–2 feet of sea level rise
3	Moderate	Asset is exposed to inundation with 2–3 feet of sea level rise
2	Moderate-Low	Asset is exposed to inundation with 3–4 feet of sea level rise
1	Low	Asset is exposed to inundation with 4–5 feet of sea level rise
0	No Exposure	Asset is not exposed to inundation under up to 5 feet of sea level rise



Heat

Rising temperatures can intensify the urban heat island effect, where developed areas are significantly hotter than surrounding rural areas. This occurs because cities typically have less vegetation and open water, more heat-absorbing surfaces like pavement and buildings, and activities that generate heat, such as vehicle traffic. Extreme heat can pose serious health risks, particularly for vulnerable populations such as older adults and people with disabilities.

Surface temperature data were obtained from NJDEP's Urban Heat Islands and Land Surface Temperatures in New Jersey Viewer, which was last updated in 2023. These data show present-day variations in land surface temperatures across the Study Area. Note surface temperatures measure how hot the ground and built environment become, and are different from the air temperatures that people feel in the atmosphere, although areas experiencing higher surface temperatures tend to correlate with higher atmospheric temperatures.

While the spatial data reflect current conditions, **Table 3.4** summarizes projected increases in air temperature under two future emissions scenarios. These scenarios represent different levels of greenhouse gas emissions, with higher emissions leading to greater warming over time.

Each asset's exposure to extreme heat was classified based on whether it is located in areas experiencing high land surface temperatures, with higher values representing greater heat exposure, as shown in **Table 3.5**.

TABLE 3.4: Current and future heat conditions.

HEAT SCENARIO	EXISTING CONDITIONS	FUTURE CONDITIONS	
	2020	2040	2060
Lower Emissions (RCP 4.5)	+3.5°F	+2-6°F	+3-9°F
Higher Emissions (RCP 8.5)	+3.5°F	+3-7°F	+6-13°F

TABLE 3.5: Heat exposure score classifications.

EXPOSURE SCORE		DEFINITION
5	High	Asset is located within an area where the maximum measured surface temperature exceeds 125°F
4	Moderate-High	Asset is located within an area where the maximum measured surface temperature is between 120°F and 125°F
3	Moderate	Asset is located within an area where the maximum measured surface temperature is between 110°F and 120°F
2	Moderate-Low	Asset is located within an area where the maximum measured surface temperature is between 100°F and 110°F
1	Low	Asset is located within an area where the maximum measured surface temperature is less than 100°F



Landslide

Periods of heavy rainfall can increase the likelihood of landslides, particularly in areas with steeper slopes and loose or unstable soils. Similarly increased sea levels and flood event conditions can lead to landslides and erosion along the banks of river and streams. Landslides can damage buildings and infrastructure, block roads, and in severe cases, result in injuries or loss of life.

Landslide susceptibility data were sourced from the U.S. Geological Survey's (USGS) Slope-Relief Threshold Landslide Susceptibility Models for the United States and Puerto Rico, last updated in 2024. These data are provided at a 90-meter resolution and reflect current conditions only; future climate impacts are not included. The model uses factors such as topography and land cover to generate a landslide susceptibility score ranging from 0 to 81, with higher scores indicating a greater likelihood of landslide occurrence.

The dataset also includes mapped locations of documented landslides through 2022, as well as county-level summaries of susceptible terrain.

Each asset's exposure to landslides was classified based on whether it is located in areas of modeled landslide susceptibility, with higher values representing greater exposure, as shown in **Table 3.6**.



Wildfire

Hotter temperatures, drier summer conditions, the buildup of unmanaged vegetation, and warmer temperatures extending into the State's wildlife season have contributed to increasing wildfire risk across many parts of the country. Although New Jersey's State Forests are located 15–20 miles from the Study Area, wildfire risk still exists due to forested and vegetated areas within and near the community. In addition to direct fire damage, wildfires can degrade regional air quality and pose public health concerns, even when fires occur some distance away.

TABLE 3.6: Landslide exposure score classifications.

EXPOSURE SCORE		DEFINITION
5	High	Asset is located within an area of relatively high landslide susceptibility (model score 55–81)
4	Moderate-High	Asset is located within an area of moderate–high landslide susceptibility (model score 38–55)
3	Moderate	Asset is located within an area of moderate landslide susceptibility (model score 22–38)
2	Moderate-Low	Asset is located within an area of moderate–low landslide susceptibility (model score 7–22)
1	Low	Asset is located within an area of low landslide susceptibility (model score 0–7)
0	No Exposure	Asset is not located within an area of modeled landslide susceptibility

Wildfire data were obtained from the U.S. Department of Agriculture (USDA) Forest Service Wildfire Risk to Communities dataset, accessed through the New Jersey Wildfire Risk Assessment Portal. The data were last updated in 2024 and represent wildfire risk based on landscape conditions from 2022 and 2023. For this assessment, burn probability (also referred to as wildfire likelihood) was used to estimate the annual chance that a given location could experience wildfire, and generally range from 0% to 2.3% in the Study Area. These data reflect existing conditions and do not incorporate future climate projections.

Each asset's exposure to wildfire was classified based on whether it is located in areas with a modeled probability of wildfire occurrence, with higher values representing greater exposure, as shown in **Table 3.7**.

TABLE 3.7: Wildfire exposure score classifications.

EXPOSURE SCORE		DEFINITION
5	High	Asset is located within an area with an annual wildfire burn probability greater than 0.07%
4	Moderate-High	Asset is located within an area with an annual wildfire burn probability between 0.05% and 0.07%
3	Moderate	Asset is located within an area with an annual wildfire burn probability between 0.03% and 0.05%
2	Moderate-Low	Asset is located within an area with an annual wildfire burn probability between 0.02% and 0.03%
1	Low	Asset is located within an area with an annual wildfire burn probability between 0% and 0.02%
0	No Exposure	Asset is not located within an area with a modeled wildfire burn probability



Drought

Increasing temperatures can lead to drier summers and reduced soil moisture, contributing to drought conditions. The precipitation cycles and extremes also significantly contribute to drought. There are also increasing incidents of "flash droughts" occurring. In urban areas, drought can strain local water supplies, potentially affecting drinking water availability and increasing costs for residents. During severe droughts, water use restrictions may also be necessary to conserve limited resources.

Drought conditions were evaluated using data from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, which draws from the Soil Survey Geographic Database (SSURGO). These data, last updated in 2024, reflect current soil characteristics related to drought vulnerability and do not account for future climate changes.

Each asset's exposure to drought was classified based on whether it is located in an area with soil types characterized by drought vulnerability, with higher values representing greater exposure, as shown in **Table 3.8**.

TABLE 3.8: Drought exposure score classifications (based on soil type).

EXPOSURE SCORE		DEFINITION
4	High	Asset is located within soil classified as highly drought-vulnerable
3	Moderate	Asset is located within soil classified as moderately drought-vulnerable
2	Moderate-Low	Asset is located within soil classified as somewhat drought-vulnerable
1	Low	Asset is located within soil classified as slightly drought-vulnerable
0	No Exposure	Asset is not located within soil classified as drought-vulnerable

Sensitivity

Each asset type was also assigned a sensitivity score for each hazard, based on a general understanding of how strongly it would be affected. Sensitivity was generalized to a simplified high-moderate-low framework as shown in **Table 3.9**.

Sensitivity scores for each hazard-asset type combination are shown in **Table 3.10**.

TABLE 3.9: Sensitivity score classifications.

SENSITIVITY SCORE		DEFINITION
3	High	Asset is likely to experience severe damage if exposed to the hazard.
2	Moderate	Asset may experience moderate or low levels of damage due to design, function, or location if exposed to the hazard.
1	Low	Asset is unlikely to experience direct damage, though indirect or secondary impacts may occur.

TABLE 3.10: Sensitivity scores for each hazard-asset type combination.

	FLOODING	SEA LEVEL RISE	HEAT	WILDFIRE	LANDSLIDE	DROUGHT
Community Resources						
Residential Buildings	3	3	2	3	3	1
Public & Commercial Buildings	3	3	1	3	3	1
Agricultural Lands	3	3	1	3	2	3
Critical Infrastructure						
Transportation Routes	3	3	2	2	3	1
Utility Infrastructure	2	3	1	3	3	2
Health & Emergency Services	2	3	1	3	3	1
Hazardous Material Sites	2	3	1	3	3	1
Natural Infrastructure						
Wetlands	1	3	1	2	1	1
Forests & Shrubland	1	3	1	3	1	1
Wildlife Habitat Areas	1	3	1	3	1	1
Social Fabric						
Residential Populations	3	3	3	3	3	1

Vulnerability and Mapping

For this assessment, vulnerability was calculated at the individual asset level and then summarized spatially for mapping and visualization. Each asset was assigned a vulnerability score by combining its exposure and sensitivity scores, which are described in earlier sections of this report. Specifically, an asset's vulnerability score is calculated as the product of its exposure score and its sensitivity score, with higher values indicating greater vulnerability to a given hazard.

To visualize how vulnerability is distributed across each municipality, individual asset vulnerability scores were aggregated into a consistent geographic grid of 250 feet by 250 feet. Each asset contributes its vulnerability score to the grid cell in which it is located. As a result, grid cells containing a larger number of highly vulnerable assets receive higher total vulnerability scores. This base grid also rolls up into a 500-foot by 500-foot summary grid, which is also used in mapping. The mapped cell size shown in this plan varies between the smaller and larger grid patterns by municipality to reflect differences in geographic area and development patterns.

PLAN ENDORSEMENT AND COMMUNITY RESILIENCE

All 11 communities participating in this study underwent the State's Plan Endorsement process, a rigorous and voluntary review process, which aims to align local planning with the State's land use policies, regulations, and priorities. Through Plan Endorsement, the communities have agreed to pursue actions to make their communities more resilient. Only communities that went through the Plan Endorsement process were eligible to participle in this Study.

This grid-based approach allows areas where vulnerable assets are concentrated to emerge visually as “hotspots” of risk. These hotspots help identify locations where mitigation or adaptation actions may be most effective. Areas without assets that are exposed to a given hazard do not register vulnerability and therefore appear as low or no vulnerability on the maps.

The gridded vulnerability results form the basis of the community hazard profiles presented in this report. Vulnerability is summarized for each hazard both overall and by four impact themes: community resources, critical infrastructure, natural infrastructure, and social fabric. Although adaptive capacity is not quantified in this analysis, qualitative information on each community’s ability to respond to and recover from hazards is included in the hazard profiles and informs the identification of recommended resilience actions.

Figure 3.3 through **Figure 3.8** illustrate overall vulnerability for each hazard across the study area. These maps incorporate all impact themes, with darker colors representing higher levels of vulnerability. While detailed impacts and recommended actions are discussed later in the report (see **Section 6**), the maps provide a high-level visual overview of where hazard-related vulnerabilities are most concentrated.

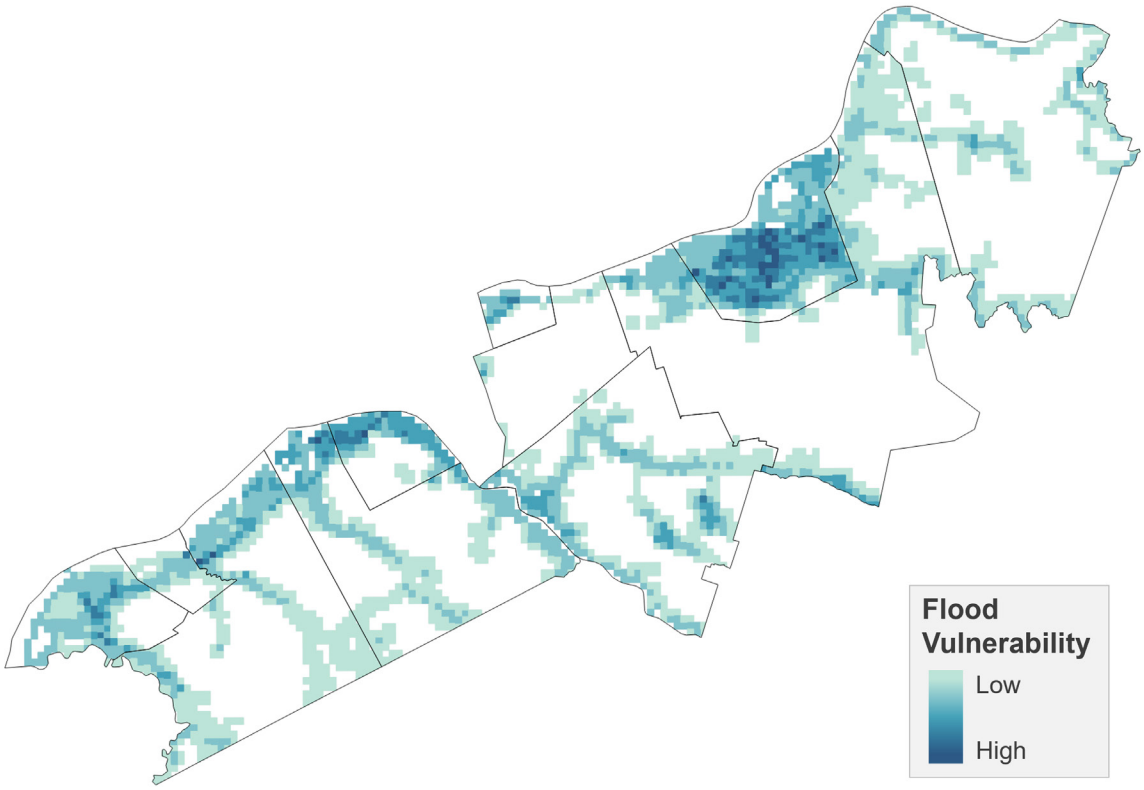


FIGURE 3.3: Study Area flooding vulnerability.

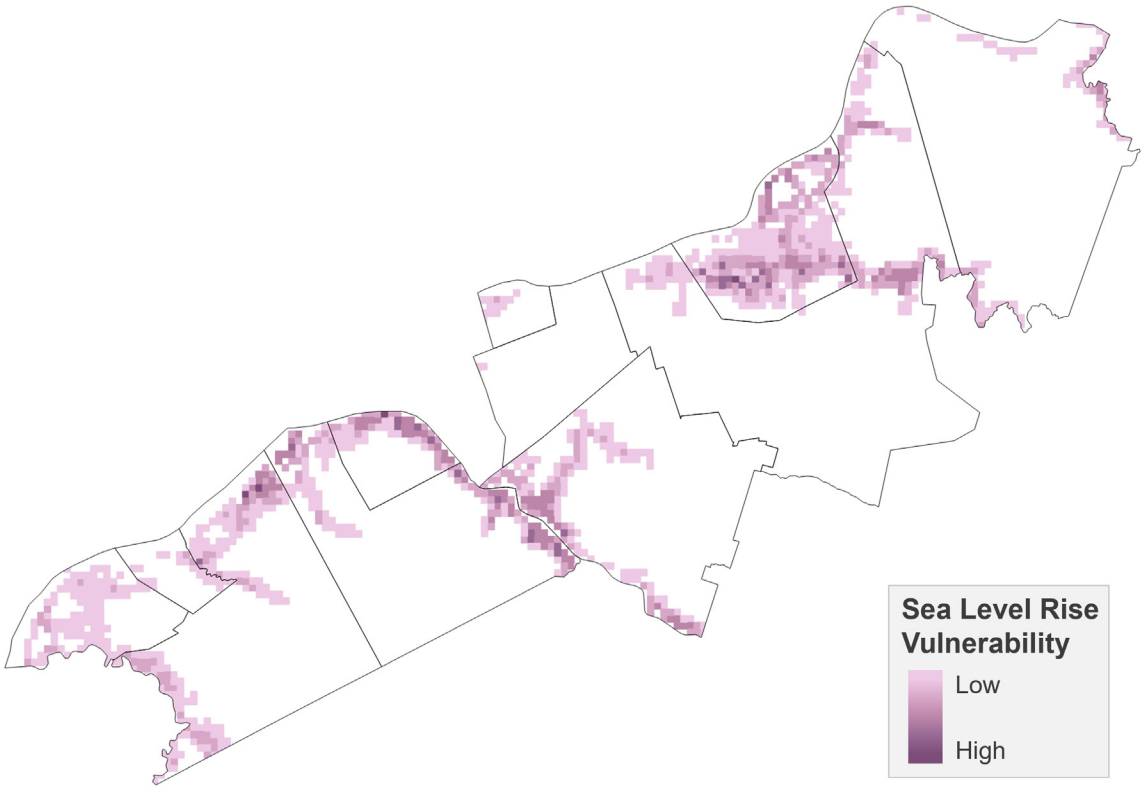


FIGURE 3.4: Study Area sea level rise vulnerability.

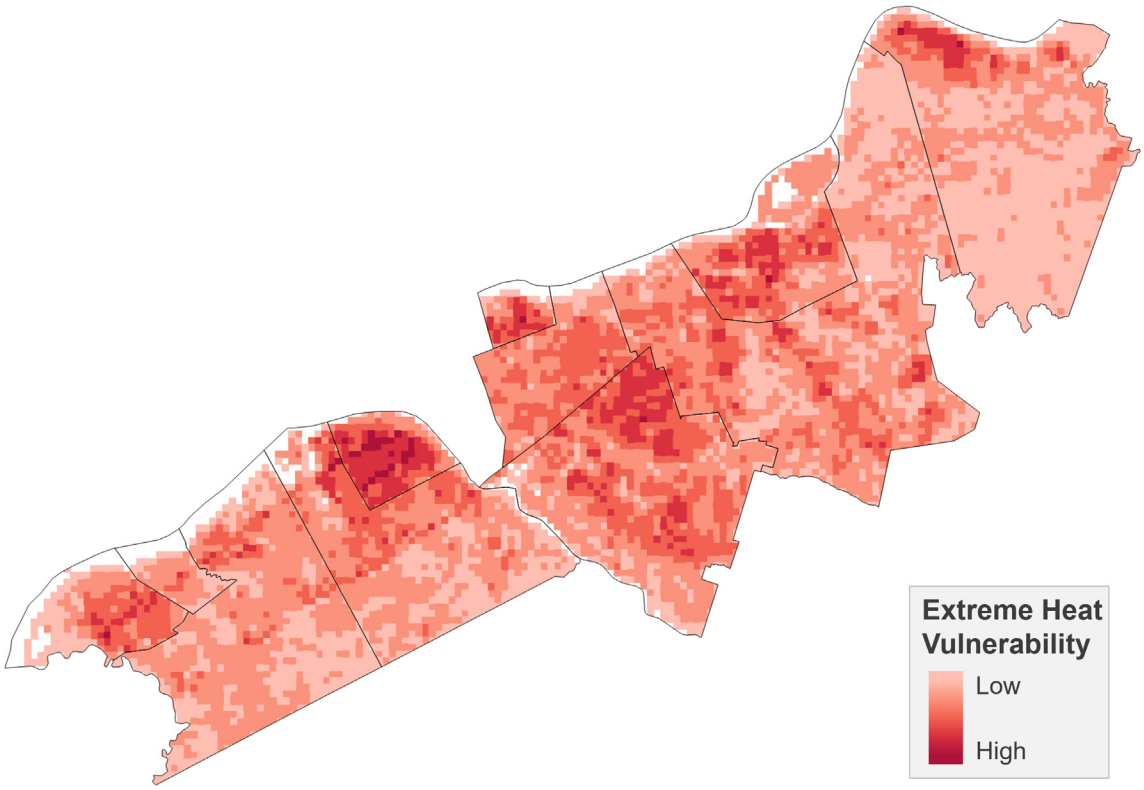


FIGURE 3.5: Study Area extreme heat vulnerability.

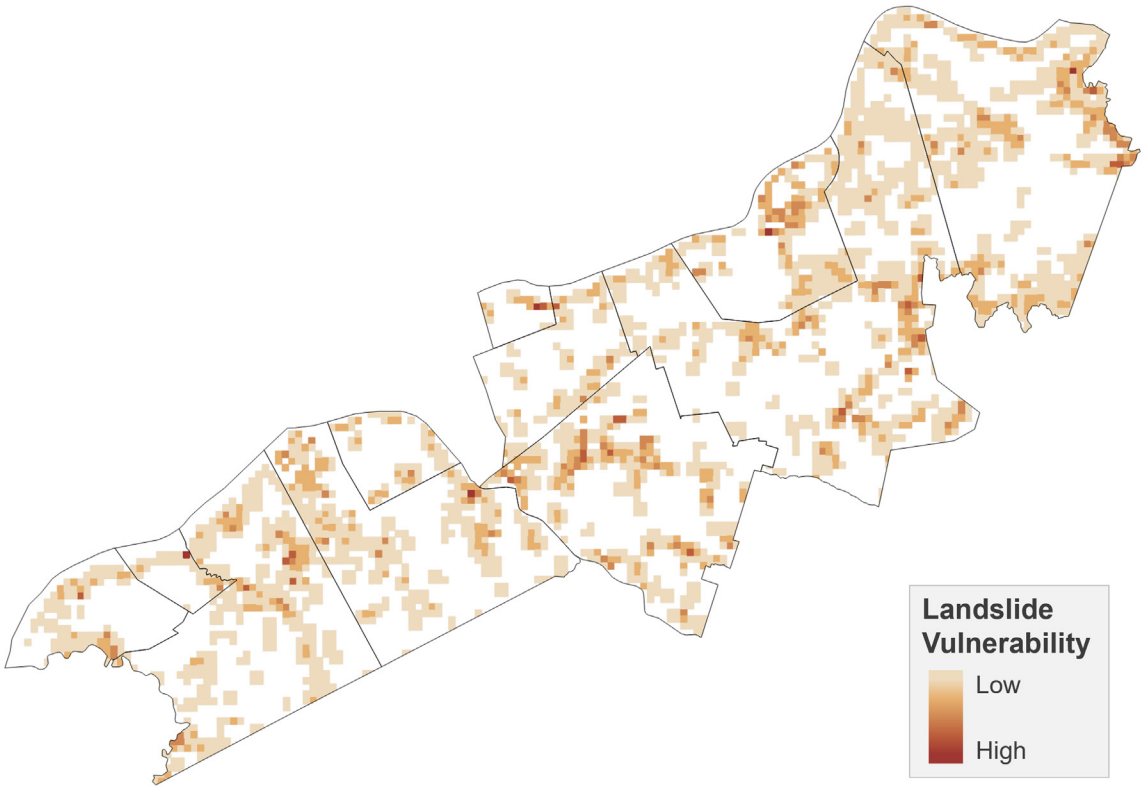


FIGURE 3.6: Study Area landslide vulnerability.

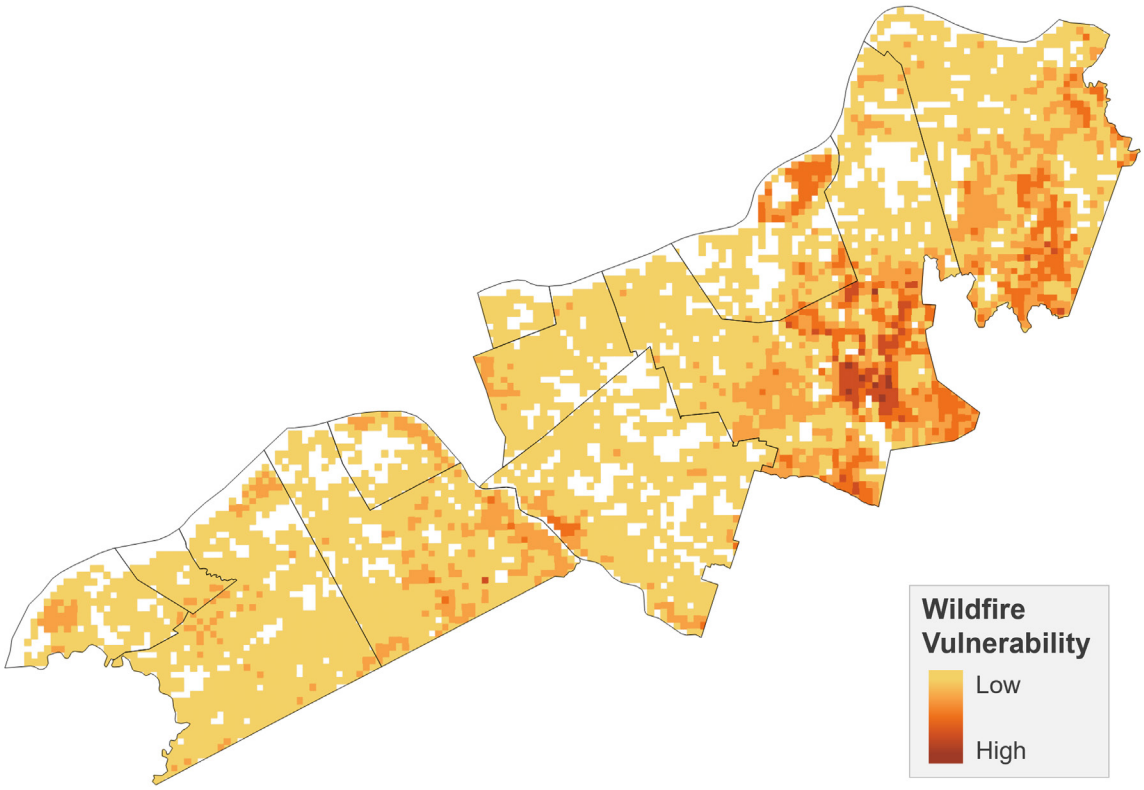


FIGURE 3.7: Study Area wildfire vulnerability.

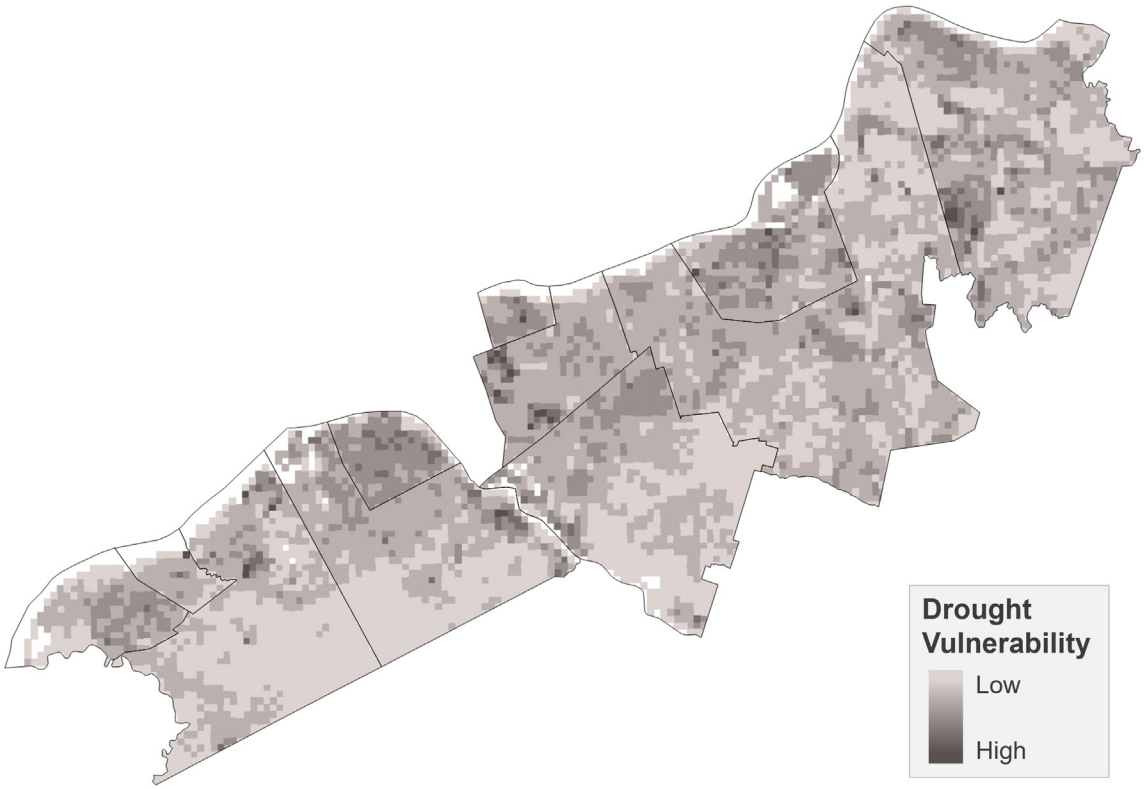


FIGURE 3.8: Study Area drought vulnerability.

Comparing Across Hazards

The vulnerability assessment and resulting data products show the relative exposure and sensitivity of assets to each hazard independently. In other words, they highlight which areas or assets are more exposed in a community to a given hazard, but they do not compare which hazards pose the greatest overall risk across communities. Some hazards are more likely to be major drivers of risk than others. For example, an area may show relatively high exposure to wildfire compared with other parts of the same community, but overall, wildfire may represent a much smaller source of risk than flooding.

To help provide this broader context, FEMA's National Risk Index (NRI) is referenced, which estimates the Expected Annual Loss (EAL) for each hazard type. EAL is the average economic loss (in dollars) a community can expect each year from natural hazards, based on a combination of hazard likelihood and the economic consequences if an event occurs. The NRI calculates EAL across three categories: buildings, agriculture, and population (where fatalities and injuries are converted into dollar values). By expressing losses in dollar terms, the NRI allows hazards to be compared on a common scale.

The NRI has several notable limitations. First, it has a narrow focus for economic losses, only including building damage, agricultural losses, and population impacts, while other important consequences (such as ecosystem services, cultural resources, infrastructure disruption, or long-term health and displacement impacts) are not captured. Second, it is grounded in present-day and historical data and increases in hazard frequency or severity due to climate change are generally not reflected; projected sea level rise is therefore not included. Finally, the NRI is produced at a relatively coarse scale, primarily at the census-tract level, using national datasets, which can overlook local details and specific community assets. For this study, the NRI is therefore used only as a complementary reference point to illustrate which hazards tend to drive the largest modeled economic losses across the 11 communities.

Figure 3.9 shows NRI EAL by hazard, aggregated across communities. Flooding (both coastal and riverine) represents the largest overall driver of expected annual loss, followed by heat waves. **Table 3.11** provides a more detailed view of EAL by community. For the communities of Edgewater Park, Burlington Township, and Florence Township, heat waves surpass flooding as the largest driver of modeled risk, due to anticipated impacts on population health. Wildfire poses a lower but still notable risk, particularly in Cinnaminson, Burlington, and Florence Townships, where it shows the greatest potential for economic losses. By comparison, drought and landslides are modeled to pose extremely low economic risks, with expected annual losses of less than $10,000 (in 2026 dollars) across the entire Study Area. Even in Florence Township, which has the highest measured risk for these two hazards, the overall likelihood and consequences remain much smaller than for flooding, heat, or wildfire.

FIGURE 3.9: Graph of total expected annual losses (in 2026 dollars) across all 11 communities for the hazards of focus in this study.

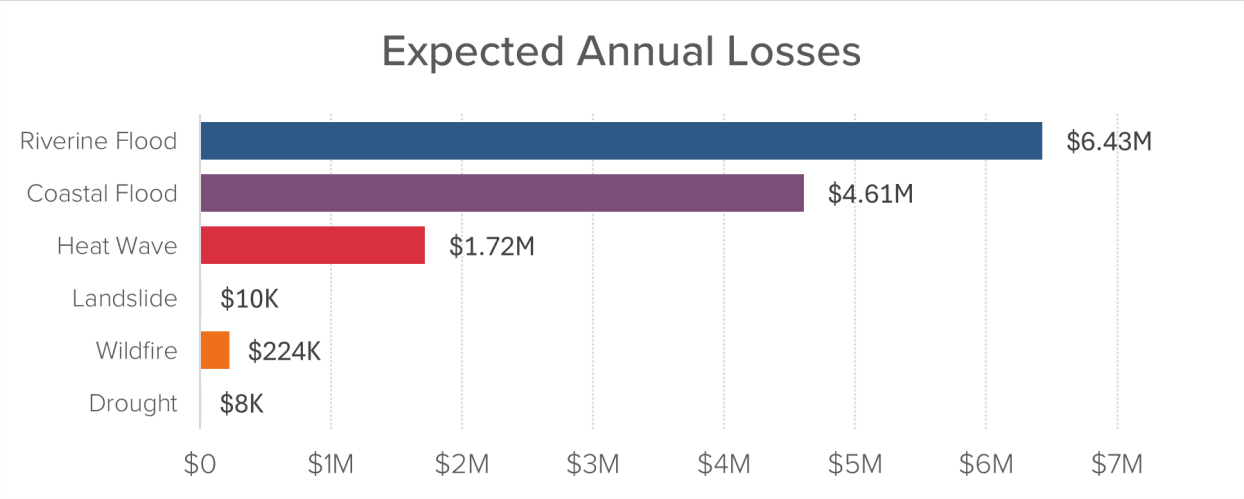


TABLE 3.11: Total expected annual losses for each community for the hazards of focus in this study.

COMMUNITY	FLOODING		HEAT WAVE	LANDSLIDE	WILDFIRE	DROUGHT
	Riverine	Coastal				
Beverly City	$52,193	$15,149	$30,151	--	--	--
Burlington City	$4,091,917	$1,184,226	$117,551	$171	$16,040	--
Burlington Township	$146,349	$148,952	$289,361	$441	$41,880	$1,909
Cinnaminson Township	$623,384	$1,708,410	$204,737	$76	$44,917	$215
Delran Township	$277,680	$425,293	$215,509	--	$18,906	$642
Edgewater Park Township	$597	$1,918	$107,743	--	$24,443	$578
Florence Township	$44,818	$15,264	$154,450	$8,466	$40,458	$4,810
Palmyra Borough	$436,041	$204,136	$89,741	--	$495	$13
Riverside Township	$268,039	$452,162	$96,558	--	$714	--
Riverton Borough	$86,910	$63,606	$33,348	--	$9,464	--
Willingboro Township	$399,662	$393,433	$384,566	$718	$27,066	$136

SECTION 4: Planning Analysis

The effort to plan for a future that is resilient to climate change is inherently interconnected to other planning-related issues, including sustainability, emergency management, economic development, and affordable housing. Therefore, as part of this study, the Project Team examined each municipality's existing municipal and regional plans, zoning and development policies, redevelopment areas, and affordable housing obligations to identify their implications for climate resilience planning and actions and opportunities for alignment. The intention is for this work to be interconnected and integrated into future efforts, ensuring that community improvement and development activities are aligned with and informed by climate resilience objectives.

Municipal Plan Review

Municipal plans of the 11 communities were reviewed for goals and initiatives related to climate change. Plans ranged from stormwater management plans, to flood damage ordinances, to master plans, transportation and circulation plans, transit-oriented development studies, and more. It was found that historically, the municipalities along the Route 130 corridor in the Study Area have implemented policies aimed at protecting environmentally sensitive areas such as wetlands, floodplains, and coastal zones utilizing tools such as their municipal plans. Over time, in many of the communities, these efforts have gradually evolved to incorporate planning practices that support resiliency and address the increasing risks associated with climate change. Albeit not always *explicitly* framed in climate change-specific terms, the policies and goals adopted by these municipalities often align with national and international best practices to mitigate and adapt to climate change-related hazards.

Notably, two municipalities in the Study Area have directly addressed resilience through the adoption of a CCRHVA (Florence and Edgewater Park). Willingboro has also completed a CCRHVA.

The municipal work has been supported by county, state and regional planning efforts. All municipalities in the Study Area participate in the County's Hazard Mitigation Plan (HMP, last updated in 2024), which provides a regional framework for resilience planning and risk reduction. Climate change and resilience planning have been conducted at the State and regional level as well, through the NJDEP and the Delaware Valley Regional Planning Commission (DVRPC). In 2014, NJDEP prepared Coastal Vulnerability Index (CVI) mapping for over

200 municipalities across the State. This mapping identifies municipal facilities such as fire stations and schools, and evaluates the land through vulnerability classifications. CVI mapping has been prepared for each municipality in the Study Area. On the regional scale, DVRPC has prepared Coastal Vulnerability Assessment (CVA) reports for four municipalities: Burlington Township, Burlington City, Beverly, and Delran. The CVAs evaluate the municipality's vulnerabilities and provide recommendations related to climate change and resilience.

Buildout Analysis

As the municipalities in the Study Area prepare for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. To provide a sense of where new development could put residents at risk, a buildout analysis for each municipality in the Study Area was undertaken. High-capacity residential zones, small-lot overlays*, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts if not managed carefully. Buildout data supports planning initiatives that aim to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk.

This buildout analysis outlines how current zoning influences the potential future development of land across the Study Area. By applying minimum lot area requirements to parcels, the analysis generates theoretical estimates of how many new lots could be created under existing zoning. These projections do not represent imminent growth but instead offer a framework for understanding the relationship between zoning, land availability, and long-term development capacity across different zoning districts. Where available, floor area ratio (FAR) data was incorporated into the development potential analysis; however, most municipalities in the Study Area (aside from Willingboro Township) do not utilize FAR standards. Municipally-institutional properties such as schools and religious institutions have been excluded from this analysis, as their redevelopment is unlikely and difficult to reasonably predict. There is pending legislation that would allow for development of affordable housing on land used for religious purposes.

The analysis used GIS parcel data and zoning overlays to model development capacity. For parcels that span multiple zoning districts, the zoning designation with the greatest area of overlap was applied. However, at the time of any actual development on a split-zoned parcel, the more restrictive zoning and its corresponding minimum lot area would govern. Results should be interpreted accordingly and treated as generalized estimates rather than site-specific outcomes.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/ industrial areas where large lots can have multiple/large buildings and the areas may be fairly built out from a square footage perspective, even if zoning would allow the lots to be subdivided. As such, this analysis should be interpreted cautiously and viewed as a zoning-based exercise rather than a certain forecast of future development. In practice, development

* Small-lot overlays enable construction of single-family homes on smaller lots than typically required by existing zoning, permitting denser development.

and redevelopment is an effort at the local, county, and state levels. The built-out capacities contained in this report are the results of analysis of available land(s) at the time of this report, and are not inclusive of any easements, deed restrictions (unless protected via state mechanisms), or redevelopment areas.

Redevelopment Areas

While the Analysis focused on hypothetical development from a zoning perspective, the Project Team also identified each municipality's designated redevelopment areas. It is essential to strike a balance between development and climate resilience, particularly in areas where development or substantial redevelopment may inadvertently exacerbate risk. Therefore, current and future vulnerabilities and risks should be taken into consideration in these redevelopment efforts.

Round IV Affordable Housing Plans

In New Jersey, through decades of litigation and state legislation, each municipality has a constitutional obligation to provide affordable housing. Efforts to meet this obligation should also be considered along with present and future hazard information in order to ensure that residents are protected from unnecessary exposure to climate-related hazards.

For the "Fourth Round" (Round IV) of affordable housing obligations (July 1, 2025 to December 2035), the New Jersey Department of Community Affairs (DCA) outlined each municipality's affordable housing obligation. The DCA utilized three factors to determine municipal obligations, including non-residential valuation, income capacity, and land capacity. **Table 4.1** depicts the affordable housing obligation of each municipality in the Study Area.

TABLE 4.1: Summary of Round IV of Affordable Housing Obligations (Prospective Need)

MUNICIPALITY	ORIGINAL OBLIGATION (DCA)	ACTUAL OBLIGATION (AFTER CHALLENGE)
Beverly City	19	No Challenge
Burlington City	30	No Challenge
Burlington Township	308	235
Cinnaminson Township	93	89
Delran Township	96	No Challenge
Edgewater Park Township	59	No Challenge
Florence Township	107	No Challenge
Palmyra Borough	31	29
Riverside Township	18	No Challenge
Riverton Borough	30	No Challenge
Willingboro Township	77	No Challenge

Every municipality in the State had a deadline of June 30, 2025 to prepare and adopt Housing Element and Fair Share Plans (HEFSPs). The HEFSP details how the municipality will satisfy their affordable housing obligation. There are various mechanisms that a municipality can use to satisfy their affordable housing obligation, including inclusionary development, vacant land adjustments, zoning overlays and many others.

For the municipalities in the Study Area, there are a variety of proposed mechanisms to address their obligation, including inclusionary development. Although demonstrating site suitability for affordable housing sites is a required part of HEFSPs, the plans typically do not contain a significant level of detail for site design. Oftentimes, the site design aspect of the project, where environmental constraints are mitigated or factored into the design, is frequently not considered or occurs later in the process. The HEFSPs function as a policy document, developing the framework for identifying locations for affordable housing in the municipality. Amendments to HEFSPs are common when factors such as market conditions or environmental conditions are accounted for. Furthermore, rather than specific sites, a HEFSP may identify a general area for affordable housing. Examples include zoning overlays or redevelopment planning.

While it is difficult to determine with a degree of certainty the location(s) of the municipality's affordable housing and whether these locations place vulnerable populations in vulnerable areas (e.g. wetlands), it is important to note that ***most of the municipalities in the Study Area have wetlands or flood hazard areas noted in their proposed affordable housing plans***. However, ***they do not represent the entirety of the proposed affordable housing strategy in the respective municipality***. Burlington and Cinnaminson Township identify affordable housing sites where wetlands are present. Beverly, Burlington City, and Riverside Township identify sites where flood hazards areas are present. Florence, Palmyra, and Willingboro identify sites where both wetlands and flood hazard areas are present.

SECTION 5: Resilience Strategy

Planning for climate resilience must extend beyond identifying risks and opportunities to developing specific goals and implementable actions. Building upon information collected and developed through stakeholder engagement, vulnerability assessment, and planning analysis, the Project Team worked with each municipality to develop its own policy statement and resilience actions to guide CCRHVA implementation and next steps.

Policy Statement

To meet the requirements of the MLUL, each municipality must have a policy statement regarding the relationship between the CCRHVA and other plans. The policy statement must cover the consistency, coordination, and integration of the CCRHVA with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan.

The Project Team worked with officials from each municipality to draft and refine such a policy statement. The statements build upon the findings of the vulnerability assessment, community outreach, and previous planning commitments.

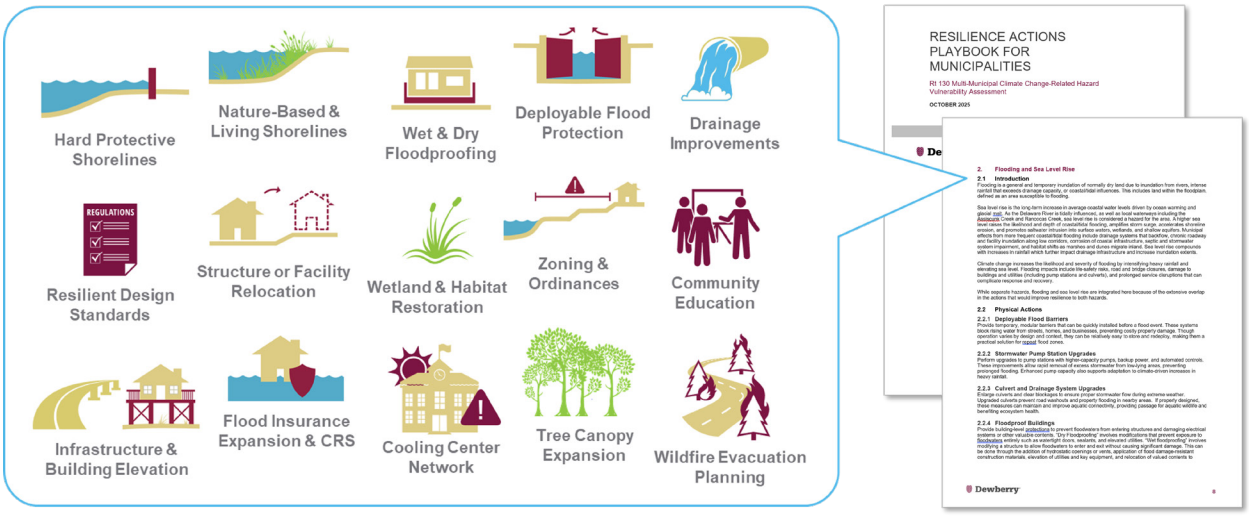
Resilience Actions

Resilience actions were developed for each of the 11 municipalities included in the study. These actions address both municipality-specific needs and shared challenges along the Route 130 Corridor, and range in type and scale from large infrastructure investments and nature-based solutions to non-structural measures such as policy updates and building code enhancements. All actions are consistent with Municipal Land Use Law (MLUL) requirements and were developed in close coordination with Burlington County, municipal staff, and public stakeholders.

The resilience actions build upon existing planning efforts, including municipal capital improvement plans (CIPs), the Burlington County Hazard Mitigation Plan (HMP), and other relevant local and regional plans. Each action includes a brief description, identified or potential responsible parties, an estimated order-of-magnitude cost, potential funding sources, and a general timeline for implementation.

To support a consistent and transparent approach to identifying resilience actions, the Project Team developed a Resilience Actions Playbook (**Figure 5.1**). The Playbook serves as a reference tool for municipalities, outlining typical strategies for addressing the six hazards evaluated in this study. It

FIGURE 5.1: Graph of total expected annual losses across all 11 communities for the hazards of focus in this study.



includes generalized descriptions of 61 physical actions and 25 policy and planning actions that may reduce risk from one or more climate-related hazards. The Playbook is intended to inform local decision-making rather than prescribe a fixed set of actions.

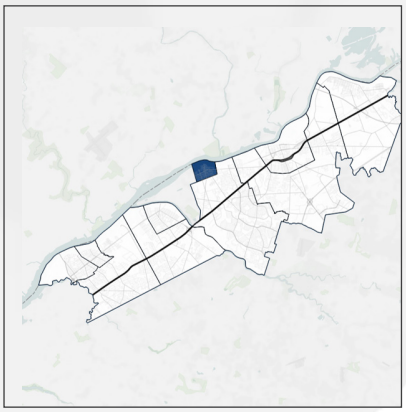
As noted in both the Playbook and discussions with local officials, a municipality's ability to implement certain actions varies based on authority, resources, and local context. Some actions may be best advanced through coordination among multiple municipalities or in partnership with county, state, or federal agencies. Additionally, not all actions are appropriate or cost-effective for every community; measures suitable for areas with higher risk or exposure may not be warranted in lower-risk settings.

Because the project spans multiple municipalities, a key theme that emerged during stakeholder engagement was the interconnected nature of climate risks and resilience solutions. Actions taken in one community can affect conditions in neighboring municipalities, particularly for stormwater management, flooding, and transportation systems. For example, increasing culvert capacity in one location may alter downstream flows, while coordinated stormwater retention projects can reduce roadway flooding for multiple communities. To address these shared dynamics, each municipal CCRHVA identifies both community-specific actions and collaborative actions that can be pursued jointly. These include coordination with agencies such as the U.S. Army Corps of Engineers on dredging, NJDEP through the Blue Acres program, Burlington County and NJDOT for roadway infrastructure, and regional partners and utilities to establish coordinated responses to widespread power outages caused by severe storms.

SECTION 6: CCRHVAs for each Municipality

Section 6.1: Beverly City CCRHVA 37
Section 6.2: Burlington City CCRHVA 78
Section 6.3: Burlington Township CCRHVA 121
Section 6.4: Cinnaminson Township CCRHVA 163
Section 6.5: Delran Township CCRHVA 202
Section 6.6: Edgewater Park Township CCRHVA 241
Section 6.7: Florence Township CCRHVA 282
Section 6.8: Palmyra Borough CCRHVA 318
Section 6.9: Riverside Township CCRHVA 356
Section 6.10: Riverton Borough CCRHVA 395
Section 6.11: Willingboro Township CCRHVA 433

SECTION 6.1: Beverly City CCRHVA



Summary of Vulnerabilities and Resilience Actions for Beverly City

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Beverly City, and it is one of the primary sources of direct risk to both assets and residents. The majority of flood exposure in Beverly City can be found along the northern area of the City around the Delaware River.



Sea Level Rise: Sea level rise is a small but growing concern for Beverly City. Tidal inundation driven by sea level rise is concentrated in the north along the shore of the Delaware River. The overall extent of sea level rise hazard exposure in the City is fairly minimal, with most areas not impacted by sea level rise.



Heat: Beverly City has an overall higher risk of extreme heat compared to other hazards. Areas with the highest heat exposure can be found in the south of the City, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Beverly City has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Beverly is in the north, especially on the banks of the Delaware River.



Wildfire: Beverly City has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire risk in Beverly City is highest on the northeast and northwest corners as they have the greatest density of trees.



Drought: Beverly City has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Beverly City ranges from slightly drought vulnerable to drought vulnerable land.

Resilience actions were developed to address risks identified in Beverly City's vulnerability assessment, and include:

- City Hall Emergency Generator and Cooling Center Project
- Education and Awareness about the Register Ready Program
- Delaware River Flood Warning System Initiative
- City Hall Emergency Generator
- Emergency Services Building Emergency Generator
- Railroad Ave and Manor Road Intersection
- Beverly Sewerage Treatment Facility
- Dredge Spoils Facility
- Van Kirk and Van Sciver Retaining Walls
- Broad St Sluice and Adjacent Riverbank Redesign and Streambank Stabilization
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Beverly City (the City) is a small city of 2,489 people, situated between Delanco to the west and Edgewater Park to the east and south. The City is located along the Delaware River and much of the waterfront is within the 100-year floodplain. The western portion of the waterfront contains a large park and trail network, which acts as a buffer between the Delaware River and the residential neighborhood south of it. The City shares a River LINE light rail station with Edgewater Park to the south. **Table 6.1.1** shows socially vulnerable populations in Beverly City. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.1.1: Socially vulnerable populations in Beverly City.

DEMOGRAPHIC VARIABLE	BEVERLY CITY	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	2,489	--	9,267,014	--
Total Household Units	943	--	3,775,842	--
Occupied Housing Units	827	--	3,478,355	--
Vacant Housing Units	116	--	297,487	--
Population 18 or Younger	455	18.30%	2,031,322	21.90%
Population 65 or Older	346	13.90%	1,559,816	16.83%
Population with a disability	357	**14.50%**	975,308	10.60%

DEMOGRAPHIC VARIABLE	BEVERLY CITY	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons without a high school diploma	86	5.01%	600,736	9.30%
Persons below poverty level	376	15.14%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	6.80%	N/A*	6.20%
Persons uninsured	174	7.10%	682,266	7.40%
Persons who speak English "less than well"	115	4.85%	562,865	6.44%
Single Parent households	127	**15.36%**	198,943	5.72%
Minority Ethnicity (non-white)	1,172	47.09%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	17	1.80%	639,960	16.95%
Crowded housing units	27	3.26%	129,710	3.73%
Households with no vehicle	83	10.00%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments. While Beverly residents did not participate in the meetings or on the online platforms, Beverly City municipal staff actively attended all meetings.

Community Meetings

The first public meeting for the City of Beverly and the Townships of Edgewater Park and Willingboro took place on April 22, 2025, from 6:00 to 8:00 p.m. Approximately 10 stakeholders attended the meeting, none of whom were affiliated with Beverly City. No comments were received on behalf of Beverly City at the meeting.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting.

The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities

for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion. No attendees were from Beverly City, and no questions/comments or poll results about Beverly City were received during this meeting.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, town administrators, town engineers, and planning board secretaries from Beverly City, Edgewater Park, and Willingboro in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities.

During the meeting, Beverly shared climate change-related challenges including the inability to successfully clear water out to the river after a storm. Systems become overwhelmed and pressurized during storm events because they were not designed for high-pressure weather events. Resilience actions suggested by Beverly representatives included working with utilities to provide them with a list of critical resources in each municipality so the utility is aware of which assets to restore power to first in an emergency event. Meeting attendees discussed prioritizing evacuation strategies for residents experiencing mental or physical health challenges during storm events. It is recommended that this effort be coordinated with the Sheriff's office.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed. The draft policy statements were also reviewed. Beverly City officials expressed interest in promoting the City's heating and cooling centers to the Chill Out NJ website; signing up residents for the ReadyNJ program (currently only residents themselves can sign themselves up, which the City sees as a barrier for participation), and establishing regular meetings between the local emergency planning committees and County Office of Emergency Management (OEM).

MEETING THREE (OCTOBER)

The third and final meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the build out analysis.

Beverly representatives noted that addressing flooding hazards is most important for the City. They noted their interest in the regional actions, including continuation of road maintenance, stream cleaning, bank stabilization, channel restoration, and a coordinated response to widespread power outages. Beverly representatives indicated that the City is also very interested in the Ready NJ program and special needs registry.

Flooding and sea level rise impacts are experienced in the City, with road drainage being a big issue. Roads such as Broad St (Bridgeboro Rd) flood every time there is a storm. Representatives highlighted that the City's sewage treatment plant is located level with the river, with any water above high tide causing flooding. The City discussed both increasing maintenance for the sewage treatment plant and a capital project, such as installing a new berm. The City discussed the possibility of a multi-municipal flood warning system.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

FIGURE 6.1.1: The Frank R. Costello Municipal Building in Beverly City, NJ. *(Source: Mr. Matté, Wikimedia Commons, CC BY-SA 4.0)*



Flooding

Flooding is a significant area of concern for residents and community leaders in Beverly City, and it is one of the primary sources of direct risk to both assets and residents. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Beverly City is found along the northern area of the City around the Delaware River. These areas represent 22% of the land area in the City, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the City (71%) is not within a modeled floodplain used in this analysis.

Figure 6.1.2 shows the spatial distribution of flood vulnerability across the City, areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.1.2: Flood vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.



FIGURE 6.1.3: Flood exposure for four themes in Beverly City.



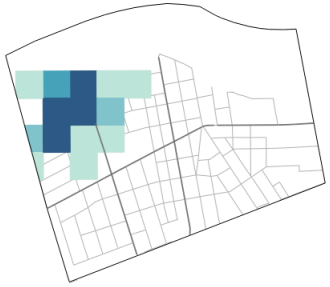
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Beverly City, approximately 1%, or 10, of the 916 residential buildings in the City are classified as having high flood exposure (within a 1% annual chance floodplain today), and 12%, or 14, of the 116 public and commercial buildings have high exposure, all of which are in the north of the City. Delacove Homes, an affordable housing complex in Beverly, is located in the flood zone.



CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Beverly City, 43% of utility infrastructure is located on Penn St, all of which are sewage disposal facilities. No health and emergency service facilities or hazardous material sites have a high exposure to flooding. One mile of transportation routes in the City also has high flood exposure. Bank Rd has the greatest flood exposure, with 0.14 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Beverly City, 21 acres, or 71%, of forests and shrublands in the City are exposed to high levels of flooding, all of which are in the northwest corner. Similarly, 53% of wetlands are also located within high flood exposure areas, primarily in the northwest corner, but they are even more resilient to the effects of flooding than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the north have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.1.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.1.2: Distribution of flood exposure scores for land area and assets in Beverly City based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	346 Acres	246 (71%)	9 (3%)	15 (4%)	76 (22%)
Community Resources					
Residential Buildings	916 Assets	823 (90%)	26 (3%)	57 (6%)	10 (1%)
Public & Commercial Buildings	116 Assets	84 (72%)	5 (4%)	13 (11%)	14 (12%)
Critical Infrastructure					
Utility Infrastructure	7 Assets	1 (14%)	--	3 (43%)	3 (43%)
Health & Emergency Services	5 Assets	5 (100%)	--	--	--
Hazardous Material Sites	3 Assets	3 (100%)	--	--	--
Transportation Routes	13 Miles	11 (82%)	0.3 (2%)	0.6 (5%)	1 (11%)
Natural Infrastructure					
Forests & Shrubland	29 Acres	6 (21%)	2 (8%)	--	21 (71%)
Wetlands	10 Acres	4 (43%)	0.2 (2%)	0.2 (2%)	5 (53%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a small but growing concern for Beverly City. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but this analysis focuses on MHHW conditions. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the north along the shore of the Delaware River. Across the City, 13 acres, or 4%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the City is fairly minimal with most areas not impacted by sea level rise. Around the end of the century, 15% of the land area in the City may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.1.4 shows the spatial distribution of sea level rise vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.1.4: Sea level rise vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.

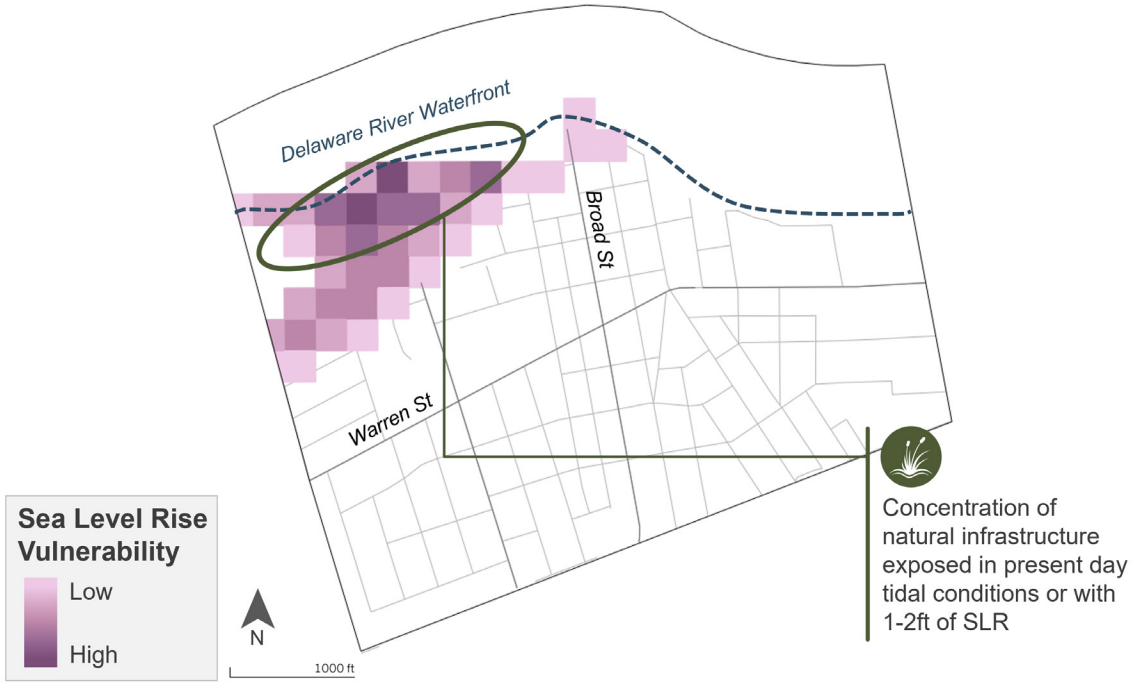
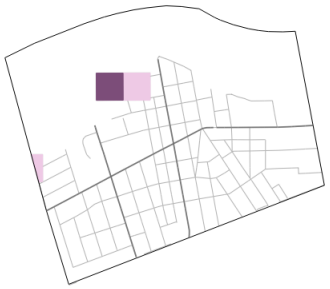
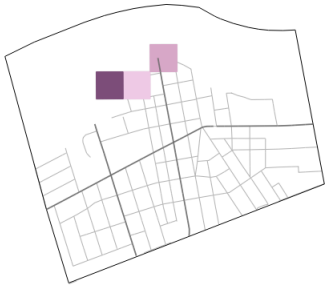


FIGURE 6.1.5: Sea level rise exposure for four themes in Beverly City.



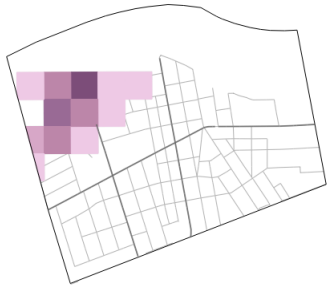
COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Beverly City, one public and commercial building would be exposed to tidal inundation at three feet of sea level rise. These buildings are concentrated in the northeast part of the City.



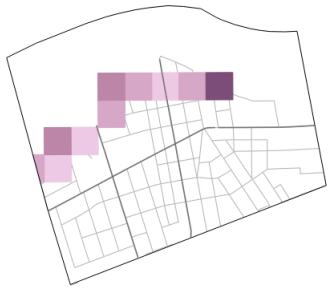
CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Beverly City, three critical infrastructure assets and .4 miles of roadway are exposed to 4-5 feet of tidal inundation. This includes the local sewage facilities.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels—wetlands are known to migrate inland with rising sea levels if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 5.5 acres, representing 53% of wetlands in the City, are exposed to 4-5 feet of tidal inundation, centralized in the northeast. Similarly, 70% of forests and shrublands are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts along the shore of the Delaware River in the northern part of the City have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.1.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed.

TABLE 6.1.3: Distribution of sea level rise exposure scores for land area and assets in Beverly City based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	346 Acres	294 (85%)	8 (2%)	4 (1%)	12 (3%)	12 (3%)	3 (1%)	13 (4%)
Community Resources								
Residential Buildings	916 Assets	915 (100%)	--	1 (<1%)	--	--	--	--
Public & Commercial Buildings	116 Assets	113 (97%)	1 (1%)	1 (1%)	1 (1%)	--	--	--
Critical Infrastructure								
Utility Infrastructure	7 Assets	4 (57%)	1 (14%)	2 (29%)	--	--	--	--
Health & Emergency Services	5 Assets	5 (100%)	--	--	--	--	--	--
Hazardous Material Sites	3 Assets	3 (100%)	--	--	--	--	--	--
Transportation Routes	13 Miles	13 (97%)	0.1 (1%)	0.2 (2%)	0.1 (<1%)	0.04 (<1%)	--	--
Natural Infrastructure								
Forests & Shrubland	29 Acres	9 (30%)	1 (4%)	2 (8%)	5 (18%)	7 (23%)	3 (10%)	3 (8%)
Wetlands	10 Acres	5 (47%)	0.3 (3%)	--	2 (23%)	2 (22%)	--	0.5 (5%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Beverly City has an overall higher risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the City. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure can be found in the south of the City. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 4% of the land area in the City has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 11% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.1.6 shows the spatial distribution of heat vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.1.6: Heat vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.

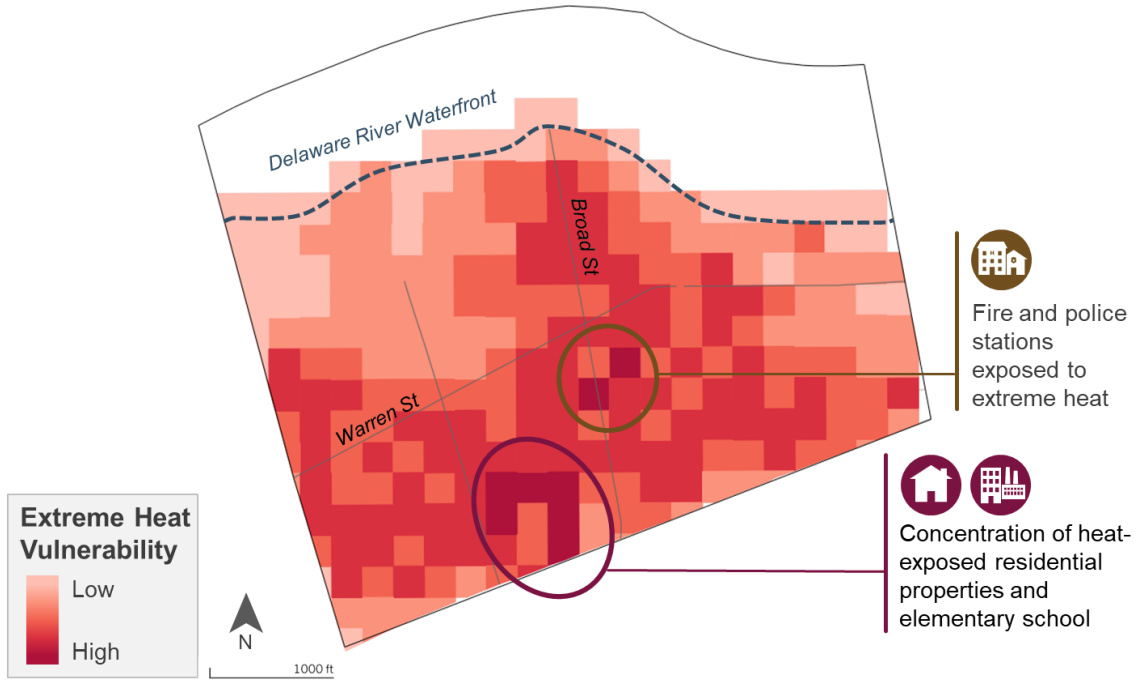
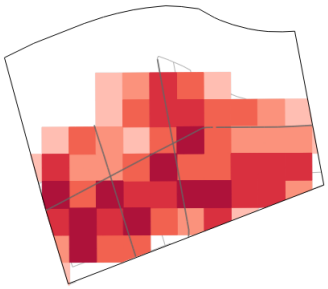
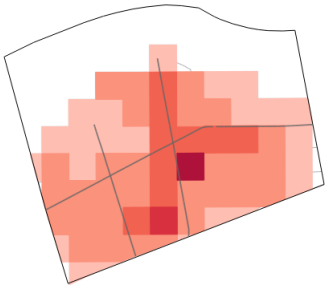


FIGURE 6.1.7: Heat exposure for four themes in Beverly City.



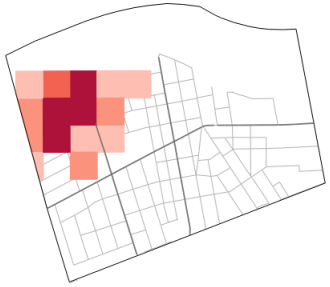
COMMUNITY RESOURCES

In Beverly City, 3% of residential buildings and 3% of public and commercial buildings have at least moderate-high heat exposure, spread throughout the City, but concentrated in the south. While these buildings are unlikely to be directly damaged by high temperatures (e.g. the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



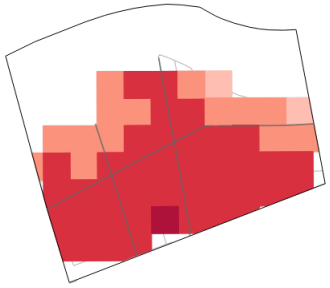
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 14% of utility infrastructure, 20% of health and emergency services, and 3% of transportation routes in the City have at least moderate-high heat exposure, concentrated in the north around Front St and in the center of the City, nearby Oak St. While many critical infrastructure assets are designed to not be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They also tend to have lower surface and air temperatures. In Beverly City, 95% of forests and shrublands and all wetlands are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are all concentrated in the northwest of the City.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the south of the City have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.1.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.1.4: Distribution of heat exposure scores for land area and assets in Beverly City based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	346 Acres	36 (11%)	79 (23%)	218 (63%)	10 (3%)	2 (1%)
Community Resources						
Residential Buildings	916 Assets	6 (1%)	169 (18%)	715 (78%)	26 (3%)	--
Public & Commercial Buildings	116 Assets	3 (3%)	11 (9%)	98 (84%)	4 (3%)	--
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	3 (43%)	3 (43%)	1 (14%)	--
Health & Emergency Services	5 Assets	--	--	4 (80%)	1 (20%)	--
Hazardous Material Sites	3 Assets	--	--	3 (100%)	--	--
Transportation Routes	13 Miles	0 (<1%)	2 (13%)	11 (83%)	0.3 (3%)	0.3 (2%)
Natural Infrastructure						
Forests & Shrubland	29 Acres	22 (74%)	6 (21%)	2 (5%)	--	--
Wetlands	10 Acres	7 (69%)	3 (31%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Beverly City has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

Figure 6.1.8 shows the spatial distribution of landslide vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.1.8: Landslide vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.

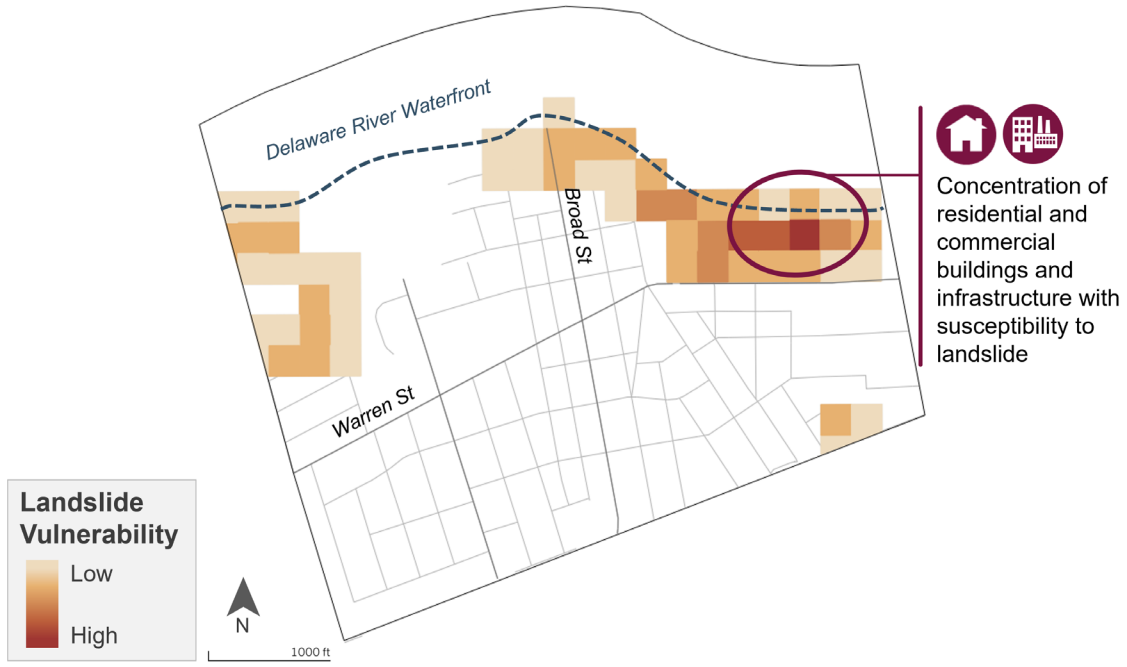
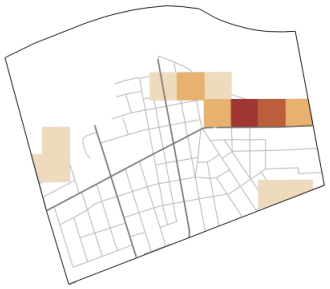


FIGURE 6.1.9: Landslide exposure for four themes in Beverly City.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the City are outside of areas modeled as susceptible to landslides. Only 7% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 1% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the northeast. Public structures in landslide-prone areas include the Beverly Free Library.



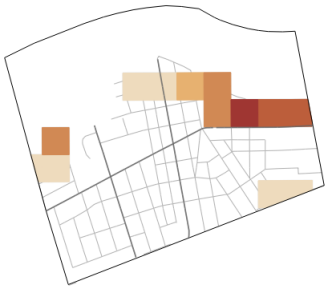
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the City is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include one water plant. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are Lake Dr., Plumtree Ln, and Springfield Ln.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 11 acres, or 28%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure. These areas are centralized in the northwest corner of the City.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. The census tract in Beverly has a low to medium concentration of socially vulnerable populations with high landslide exposure, especially along the shoreline especially in the northeast corner.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.1.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.1.5: Distribution of landslide exposure scores for land area and assets in Beverly City based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	346 Acres	300 (87%)	12 (4%)	31 (9%)	3 (1%)	--	--
Community Resources							
Residential Buildings	916 Assets	850 (93%)	17 (2%)	41 (4%)	8 (1%)	--	--
Public & Commercial Buildings	116 Assets	108 (93%)	2 (2%)	5 (4%)	1 (1%)	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	6 (86%)	--	1 (14%)	--	--	--
Health & Emergency Services	5 Assets	5 (100%)	--	--	--	--	--
Hazardous Material Sites	3 Assets	3 (100%)	--	--	--	--	--
Transportation Routes	13 Miles	12 (90%)	0.6 (5%)	0.7 (5%)	0 (<1%)	--	--
Natural Infrastructure							
Forests & Shrubland	29 Acres	23 (79%)	2 (7%)	4 (13%)	--	--	--
Wetlands	10 Acres	5 (49%)	1 (13%)	4 (38%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Beverly City has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Beverly is not particularly high, wildfires are more likely in surrounding areas, such as the southeastern parts of Burlington County. Even if infrastructure in Beverly City is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Beverly City is highest on the northeast and northwest corners as they have the greatest density of trees. These areas

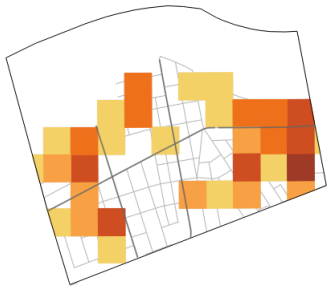
FIGURE 6.1.10: Wildfire vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.



of relatively higher wildfire hazard potential are mostly forest, especially in the northwest, as it connects to the West Ave Nature Trails. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Most land in Beverly is not considered exposed to wildfires, and no land area in the City has an annual likelihood of burning above 0.03%, which is considered moderate-low in this analysis.

Figure 6.1.10 shows the spatial distribution of wildfire vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.1.11: Wildfire exposure for four themes in Beverly City.



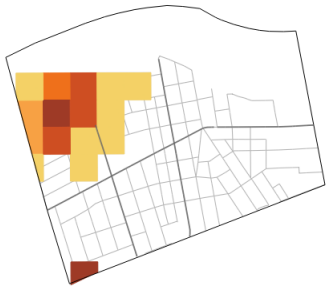
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Beverly City are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure, such as in the northeast and northwest corners of the City. Areas with higher density urban development, meanwhile, have lower exposure. No buildings in the City have an annual likelihood of burning greater than 0.03%.



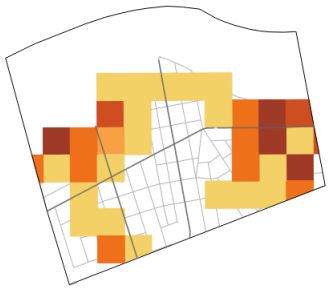
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the City do not have any known wildfire hazard exposure. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and wetlands in the northwest, as well as wetlands in the same region, have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Beverly communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Beverly City in the surrounding areas can still cause harm to Beverly residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts along the edges have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.1.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.1.6: Distribution of heat exposure scores for land area and assets in Beverly City based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	346 Acres	258 (74%)	59 (17%)	29 (8%)	--	--	--
Community Resources							
Residential Buildings	916 Assets	833 (91%)	39 (4%)	44 (5%)	--	--	--
Public & Commercial Buildings	116 Assets	111 (96%)	5 (4%)	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	7 (100%)	--	--	--	--	--
Health & Emergency Services	5 Assets	5 (100%)	--	--	--	--	--
Hazardous Material Sites	3 Assets	2 (67%)	--	1 (33%)	--	--	--
Transportation Routes	13 Miles	12 (93%)	0.4 (3%)	0.6 (4%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	29 Acres	1 (4%)	25 (86%)	3 (9%)	--	--	--
Wetlands	10 Acres	0.3 (2%)	10 (98%)	--	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Beverly City has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Beverly City ranges from slightly drought vulnerable to drought vulnerable land. The majority of the land area in the City (96%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes are spread throughout the city but most concentrated in the northwestern and central portions of the City.

Figure 6.1.12 shows the spatial distribution of drought vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.1.12: Drought vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Beverly City.

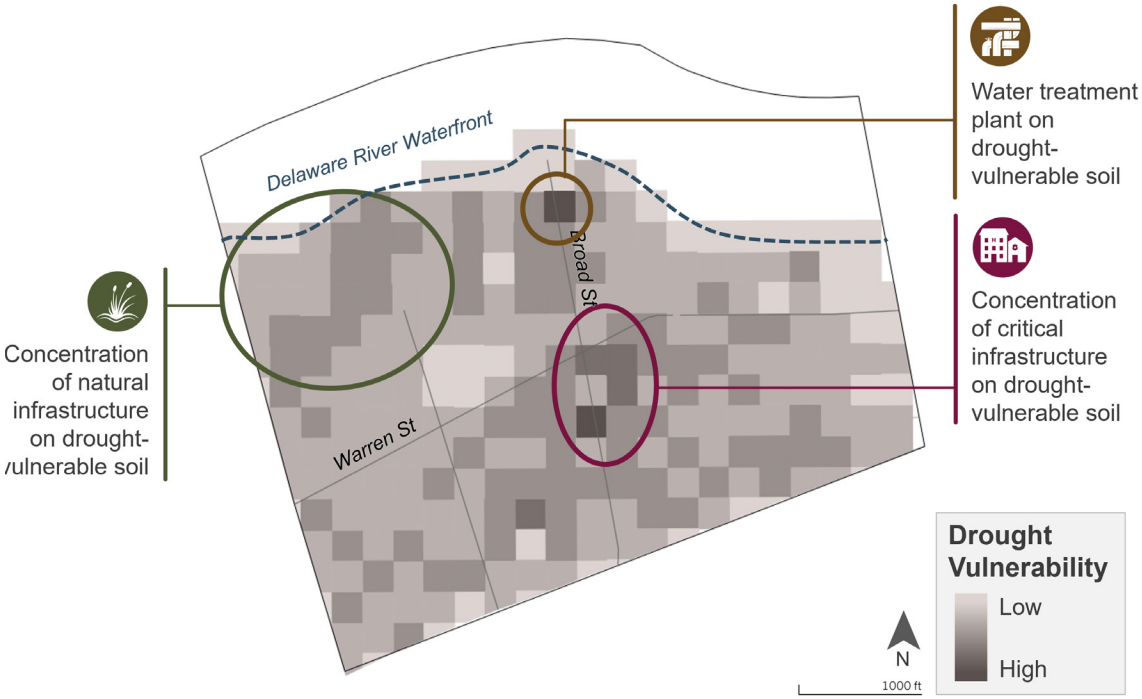
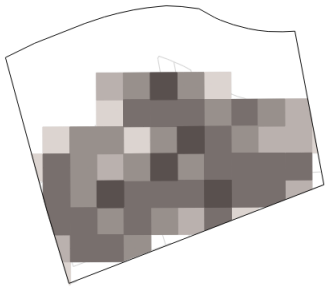
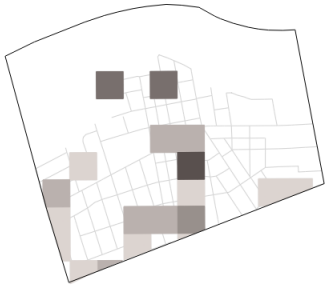


FIGURE 6.1.13: Drought exposure for four themes in Beverly City.



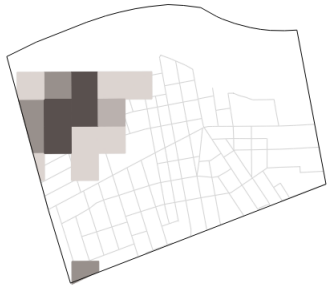
COMMUNITY RESOURCES

While agricultural land is sensitive to drought, there is no agricultural land in Beverly City. All buildings are on land modeled to be drought-vulnerable. However, these buildings are considered less directly sensitive to drought, as they are unlikely to experience physical damage or harm due to drought conditions.



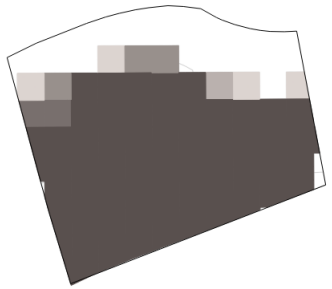
CRITICAL INFRASTRUCTURE

All critical infrastructure assets in the City are on drought-sensitive soil. All utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Beverly City, 57% of wetlands and 72% of forests and shrublands are modeled to have drought-vulnerable soil, concentrated mostly in the northwestern corner of the City.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. The one census tract encompassing Beverly City has a high rate of poverty and other social vulnerability factors, indicating that the City is susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.1.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.1.7: Distribution of drought exposure scores for land area and assets in Beverly City based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	346 Acres	--	--	--	13 (4%)	333 (96%)
Community Resources						
Residential Buildings	916 Assets	--	--	--	--	916 (100%)
Public & Commercial Buildings	116 Assets	--	--	--	--	116 (100%)
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	--	--	--	7 (100%)
Health & Emergency Services	5 Assets	--	--	--	--	5 (100%)
Hazardous Material Sites	3 Assets	--	--	--	--	3 (100%)
Transportation Routes	13 Miles	--	--	--	--	13 (100%)
Natural Infrastructure						
Forests & Shrubland	29 Acres	--	--	--	8 (28%)	21 (72%)
Wetlands	10 Acres	--	--	--	4 (43%)	6 (57%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Beverly City has taken steps to address climate change concerns through its local planning documents and policies. Climate change concerns have also been addressed in State, county and regional initiatives. Some notable plans, policies, and studies are highlighted below.

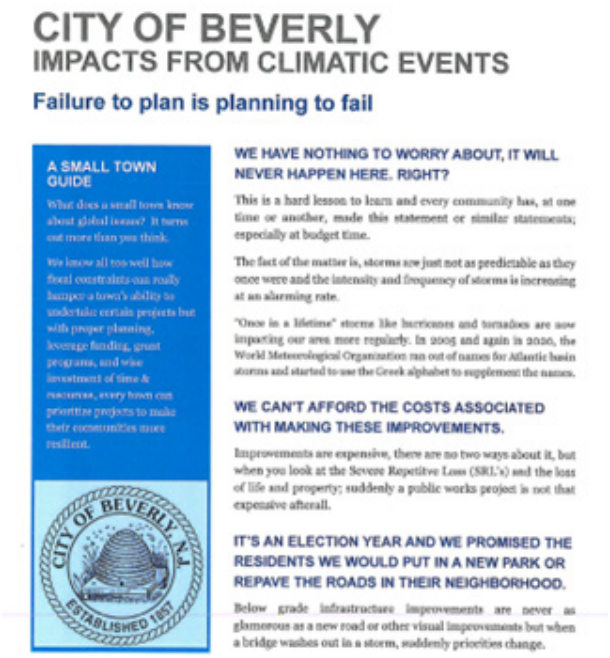
LOCAL EFFORTS

- Beverly City's 1999 Master Plan includes general language about minimizing energy usage and protecting environmental quality.
- In April 2005, Beverly City formally adopted its Municipal Stormwater Management Plan. The plan serves as a tool to control runoff, minimize flooding, and protect surface and groundwater quality. It was revised in February 2006 to reflect updated guidance and local conditions.
- Beverly City's 2017 Green Buildings and Environmental Sustainability Element outlines strategies for reducing energy and water use, expanding green infrastructure in riverside parks, greenways, and new construction design to minimize stormwater runoff, and integrating renewable energy. The plan also calls for continuing to restrict non-conforming development in the 100-year floodplain and to adopt a new flood damage prevention ordinance, which has since been implemented. These efforts promote local resilience and efficiency, but they are not presented in a broader climate change framework. Climate change itself is not directly acknowledged in any of the city's plans. The 2017 Healthy Communities Element supports transit, walking, and biking infrastructure, but stops short of linking these actions to emissions reduction or climate goals.
- Chapter 295, Flood Damage Prevention, revised by Ordinance 2024-10 on July 9, 2024, establishes Beverly City's commitment to proactive flood hazard management. It outlines key policies for floodplain development and defines the responsibilities of the city's Floodplain Administrator. The ordinance regulates all development within designated flood hazard areas to protect public safety and reduce property loss. This ordinance enables the Floodplain Administrator to interpret this chapter and ensure development project compliance with both local and NJDEP standards.
- The City has also developed a ten-page handout that highlights the impacts from climate events and underscores the need to plan. (See **Figure 6.1.14**.)

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Beverly City has a high hazard rating for severe weather; medium ratings for disease outbreak, extreme temperatures, and severe winter weather; and low ratings for

FIGURE 6.1.14: First page of the City of Beverly's "Impacts from Climatic Events" handout.



CITY OF BEVERLY
IMPACTS FROM CLIMATIC EVENTS

Failure to plan is planning to fail

A SMALL TOWN GUIDE

What does a small town know about global issues? It turns out more than you think.

We know all too well how fiscal constraints can really hamper a town's ability to undertake certain projects but with proper planning, leverage funding, grant programs, and wise investment of time & resources, every town can prioritize projects to make their communities more resilient.

CITY OF BEVERLY N.J. ESTABLISHED 1857

WE HAVE NOTHING TO WORRY ABOUT, IT WILL NEVER HAPPEN HERE. RIGHT?

This is a hard lesson to learn and every community has, at one time or another, made this statement or similar statements; especially at budget time.

The fact of the matter is, storms are just not as predictable as they once were and the intensity and frequency of storms is increasing at an alarming rate.

"Once in a lifetime" storms like hurricanes and tornadoes are now impacting our area more regularly. In 2005 and again in 2020, the World Meteorological Organization ran out of names for Atlantic basin storms and started to use the Greek alphabet to supplement the names.

WE CAN'T AFFORD THE COSTS ASSOCIATED WITH MAKING THESE IMPROVEMENTS.

Improvements are expensive, there are no two ways about it, but when you look at the Severe Repetitive Loss (SRL's) and the loss of life and property; suddenly a public works project is not that expensive afterall.

IT'S AN ELECTION YEAR AND WE PROMISED THE RESIDENTS WE WOULD PUT IN A NEW PARK OR REPAVE THE ROADS IN THEIR NEIGHBORHOOD.

Below grade infrastructure improvements are never as glamorous as a new road or other visual improvements but when a bridge washes out in a storm, suddenly priorities change.

dam failure, drought, earthquake, flood, and wildfire. The city demonstrates a strong adaptive capacity in dealing with disease outbreak, extreme temperatures, and severe winter weather; and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVI found higher-risk and moderate-risk areas in Beverly in the northwestern portion of the municipality along the Delaware River. A majority of the city is classified as lower-risk, particularly to the south further inland. There are no critical facilities in the city that are located in moderate- or higher-risk areas.

REGIONAL EFFORTS

- In 2017, the CVA prepared by DVRPC outlines several recommendations and offers guidance related to climate resilience planning within the city. The CVA identifies public infrastructure at risk of coastal flooding, such as the wastewater treatment facility, the city's seawalls, and Beverly Housing Authority-owned properties. Furthermore, the CVA identifies municipally owned properties along the Delaware River, and offers guidance on the site planning of the referenced properties. The CVA calls for coordination with Burlington County and neighboring municipalities, including Delanco Township, which utilizes Beverly's wastewater treatment facility. The CVA contains a variety of general recommendations, including targeted outreach to develop flood preparedness in existing residential areas prone to flooding and voluntary buy-outs of continually flooded property. The CVA encourages the following: long-range planning for coastal flooding; the incorporation of flood mitigation projects into capital improvement plans/hazard mitigation plans; updating zoning and building codes, restoration of floodplain parcels to natural conditions; enhanced disaster preparedness; and general recommendations related to municipal organization and public outreach.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Beverly City contains a compact set of residential, commercial, and industrial zoning districts with minimum lot sizes ranging from 2,000 square feet to 87,120 square feet. The City includes

TABLE 6.1.8: Beverly City zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-3 (Single-Family and Two-Family)	2,000 square feet
R-2 (Single-Family)	6,000 square feet
R-1 (Single-Family)	15,000 square feet
Commercial Zones' Minimum Lot Areas	
C-2 (Downtown Commercial)	5,000 square feet
C-1 (Neighborhood Commercial)	10,000 square feet
C-3 (Waterfront Development)	87,120 square feet (or 2 acres)
Industrial Zones' Minimum Lot Areas	
I (General Industrial)	10,000 square feet
Miscellaneous or Special Districts Not Considered in Buildout	
Bev_Cooper1	Zone not evaluated due to nontraditional configuration
T-1	No minimum lot area assigned; excluded from buildout

three residential zones, three commercial zones, and one industrial zone. Residential districts feature minimum lot sizes as small as 2,000 square feet in the R-3 zone, and commercial zones range from 5,000 to 87,120 square feet. The C-3 district carries the largest minimum lot area overall, which may limit its buildout despite its relatively small number of existing lots. **Table 6.1.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as special-purpose zoning, the amount of land available for new subdivision can be totaled. Beverly City contains 987 parcels and/or land masses across all zoning districts, which are not subject to the previously listed restrictions and have an estimated total of 10,000,000 square feet (or about 230 acres) of unconstrained, potentially developable land. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating possible buildout capacity using the zones' minimum lot area requirements.

The buildout analysis for Beverly City identifies the "I" Industrial District as the zone with the greatest remaining development capacity. The I Zone can accommodate 54 new parcels, representing a significant percentage increase from the number of existing parcels. For residential zoning districts, the R-2 and R-3 zones have the greatest remaining development capacity. The R-2 zone can accommodate approximately 849 additional residential lots. The R-3 zone has sufficient land for up to 703 new residential lots. These districts represent the most significant areas for potential growth in the

TABLE 6.1.9: Beverly City buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
C-1	4	25,220.00	0.58	10,000	3
C-2	64	362,084.18	8.31	5,000	72
C-3	4	755,362.00	17.34	87,120	9
I	15	231,145.74	5.31	10,000	23
I	1	305,733.40	7.02	10,000	31
R-1	75	1,472,345.21	33.80	15,000	98
R-2	189	1,604,675.79	36.84	6,000	267
R-2	364	3,488,397.43	80.08	6,000	581
R-3	114	502,651.83	11.54	2,000	251
R-3	157	902,484.92	20.72	2,000	451

* *Maximum buildout hypothetical*

City under current zoning regulations if completely built out.

The C-1 zone is the only zoning district in Beverly City where existing development exceeds the allowable capacity under current regulations. Generally, given the City's limited land area and relatively high density, development patterns generally align with established zoning standards.

Overall, Beverly City's buildout analysis yields a potential net increase of approximately 1,787 lots across all residential and non-residential zoning districts. This capacity is primarily concentrated within the R-2 and I zones as indicated in **Table 6.1.9**.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the City prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk.

In 2007, Beverly designated a large portion of the City, which includes the downtown district, the waterfront and the area near the

train station as an area of redevelopment and drafted an accompanying redevelopment plan. There are three strategic areas for the City: Cooper St, the downtown Fire Points Area, and the neighborhood to the north of Third St between Cooper and Magnolia Sts (known as the Waterfront Area). As the City looks to update their redevelopment plan, current and future vulnerabilities and risks should be considered in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

Beverly City has the following redevelopment areas noted:

- Proposed Transit Village development in Block 1280 (no name yet) – demo of 3 structures and building 54 apartments in two separate areas of block 1280. One structure is 4 stories and one structure is 3 stories.
- Cooper Street Redevelopment – Block 1171 demo of one structure and building 12 units in an inclusive development. Once completed, a companion project will completed in Block 1168, again with one structure being demolished and 12 additional units created.
- Waterfront Development – Zoning has been changed to allow 100 units in a high density development in blocks 947 & 948.

ROUND IV OF AFFORDABLE HOUSING

DCA estimated that Beverly City has an affordable housing obligation of 15 Present Need units and 19 Prospective Need affordable housing units. On January 21, 2025, the Beverly City Council accepted the DCA estimates for affordable housing. The Beverly Planning Board met on May 28, 2025 to review and adopt the proposed 2025-2035 HEFSP. The Beverly City HEFSP identified six sites for inclusion in their Round 4 HEFSP and projects a total of 191 new dwellings by 2035, which includes 60 affordable dwelling units and 131 market dwellings. Beverly City did not prepare a Vacant Land Analysis and Realistic Development Potential Analysis. The six sites are:

- Site 1: Laurel St (Blocks 947; 948 Lots 1, 2; 1) is the only site in the Special Flood Hazard Area (SFHA) and the concept is to elevate the residential units above the BFE over covered parking to comply with NJDEP Regulations. In addition, the municipality has identified several sites contributing to its affordable housing inventory through existing developments, redevelopment plans, and deed-restricted properties:
- Site 2: Block 625 Lot 8 is a deed-restricted affordable unit currently being marketed for sale to qualified low-income households. It provides 1 affordable unit.
- Site 3: 620 Third St is the location of Beverly Commons, an existing affordable, age-restricted apartment complex. The site spans 2.74 acres and contains 24 affordable units.
- Site 4: 601–613 Cooper St is designated in the 2023 Redevelopment Plan for a maximum of 35 residential units at a density of 41.4 units per acre. With a 15% affordable housing set-aside, the site would yield 5 affordable units and 30 market-rate units.

- Site 5: 633 Cooper St / 614 Chestnut St is also governed by the Redevelopment Plan, allowing for up to 19 housing units, including 3 affordable units and 16 market-rate units. This redevelopment would require the demolition of the existing structure.
- Site 6: 466 Cooper St is planned for the construction of 12 affordable housing units.

Together, these sites represent a mix of existing and proposed developments that support the municipality's affordable housing goals by offering a range of unit types and income-level accommodations. The remaining five mechanisms are not within any environmentally sensitive areas, such as wetlands, flood hazard areas, or steep slopes.

Resilience Strategy

Beverly's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Beverly City.

> Beverly City is focused on building resilience to extreme weather impacts while revitalizing its neighborhoods and commercial areas. The city aims to reduce vulnerability to flooding, especially along the waterfront, by promoting redevelopment that incorporates resilient design and infrastructure upgrades. Beverly City desires to advance transit-oriented growth near the River LINE station to reduce greenhouse gas emissions and improve connectivity. The city seeks to restore and enhance public spaces and support a diversified economy that balances environmental sustainability with community needs. Beverly is committed to fostering a safer, healthier, and more climate-resilient future for all residents.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard, and actions may be physical actions (e.g., a capital improvement), policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional — best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

BEVERLY CITY RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.

- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.1.15: Post office building in Beverly along Warren St (CR 543). *(Source: Mr. Matté, Wikimedia Commons, CC-BY-SA 4.0)*



BEVERLY CITY RESILIENCE ACTION

Emergency Generator – City Hall, Police Department, and Emergency Services Building

Beverly City will pursue the installation of an emergency backup generator at City Hall to ensure continued operations during power outages. The generator will allow City Hall to serve as an emergency cooling center during extreme heat events and other emergencies. For the Emergency Services Building, an emergency generator would be installed. Station 128 is being utilized as a regional EMS response for several communities. The EMS provider is expanding their operations out of this station but needs to be operational 24/7 and during storm events.

RESPONSIBLE PARTY	Beverly City
ESTIMATED COSTS	$550K
POSSIBLE SOURCE(S) OF FUNDING	Grants/Community Project Funding (CPF)



ESTIMATED TIMELINE

2 years

PRIORITY RATING

★★★★★

High

BEVERLY CITY RESILIENCE ACTION

Education and Awareness about the Register Ready Program

New Jersey's Special Needs Registry for Disasters allows New Jersey residents with disabilities or access and functional needs and their families, friends, caregivers and associates an opportunity to provide information to emergency response agencies so emergency responders can better plan to serve them in a disaster or other emergency. However, it can be difficult to get residents signed up for the program, as it cannot be done for them. This action would include coordinating with the county and local residents to create a venue to more easily provide residents with support in signing up for the program.

RESPONSIBLE PARTY	Beverly City, Burlington County
ESTIMATED COSTS	$1K - $15K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

Medium

BEVERLY CITY RESILIENCE ACTION

Delaware River Flood Warning System Initiative

Beverly City will look into developing and implementing a local flood warning system along the Delaware Rive to enhance emergency preparedness and response. Building on the existing stream gauge infrastructure, this system would provide real-time alerts for flood conditions to key officials, including Office of Emergency Management (OEM), Police, and Fire Departments. The warning system will help ensure timely communication and coordinated action during flood events. Beverly City will coordinate with neighboring municipalities such as Delran and Riverside to explore shared technology.

RESPONSIBLE PARTY	Beverly City, State of New Jersey, DRBC, Coast Guard
ESTIMATED COSTS	$100K - $1M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, Grants



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

★★★☆☆

Medium

BEVERLY CITY RESILIENCE ACTION

Railroad Ave and Manor Rd Intersection

To address frequent flooding issues at this intersection, new storm sewer installation the entire length of Lee Ave is needed. An additional storm pipe section needs to be added on Railroad Ave between Bentley Ave and Broad St. The City has completed preliminary engineering on this improvement. .

RESPONSIBLE PARTY Beverly City

ESTIMATED COSTS $900K

POSSIBLE SOURCE(S) OF FUNDING Municipal Aid



ESTIMATED TIMELINE

5 years*

PRIORITY RATING

★★★☆☆

Medium

**Railroad Ave portion anticipated to be complete within the next 2 years.*

BEVERLY CITY RESILIENCE ACTION

Beverly Sewerage Treatment Facility

Improvements to the Beverly Sewerage Treatment facility are needed to increase the facility's resilience. Parts of the facility such as the headworks, grit chamber, chlorine contact tanks, and associated control facilities are at grade and should be moved or elevated or a berm could be installed around the facility to prevent tidal flooding/ storm surge. The City has completed preliminary engineering discussions. .

RESPONSIBLE PARTY Beverly City

ESTIMATED COSTS $1.5M - $4M

POSSIBLE SOURCE(S) OF FUNDING I-Bank, Financing



ESTIMATED TIMELINE

5-10 years*

PRIORITY RATING

★★★★★

High

**Headworks are currently in design (anticipated 1 year)*

BEVERLY CITY RESILIENCE ACTION

Dredge Spoils Facility

Dredging is needed for the drainage channel fronting the USACE/ NJDEP Dredge Disposal Site located in Beverly City and Delanco Township. Debris and sedimentation in the channel is causing flooding in both towns..

RESPONSIBLE PARTY USACE, NJDEP

ESTIMATED COSTS $1.5M - $4M

POSSIBLE SOURCE(S) OF FUNDING Federal and state funds



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium-High

BEVERLY CITY RESILIENCE ACTION

Van Kirk and Van Sciver Retaining Walls

Retaining walls located at Van Kirk and Van Sciver terminuses are eroding. These walls encase several outfalls from the City MS4 and County Storm System. New hardened infrastructure needs to be designed, and installed. Short term emergency measures can be implemented to reinforce the existing until long-term measures can be implemented.

RESPONSIBLE PARTY Beverly City, Burlington County, Coast Guard (USCG), USACE

ESTIMATED COSTS $1M - $2.5M

POSSIBLE SOURCE(S) OF FUNDING Financing



ESTIMATED TIMELINE

5-10 years

PRIORITY RATING

★★☆☆☆

Medium-Low

BEVERLY CITY RESILIENCE ACTION

Broad St Sluice and Adjacent Riverbank Redesign and Streambank Stabilization

New hardened infrastructure is needed to prevent erosion around the Broad St sluice. Core stone has been installed as a temporary measure to reduce erosion.

RESPONSIBLE PARTY	Beverly City, USCG
ESTIMATED COSTS	$500K - $1.2M (not including permitting)
POSSIBLE SOURCE(S) OF FUNDING	Developer, Grants, Borrowing



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium



REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

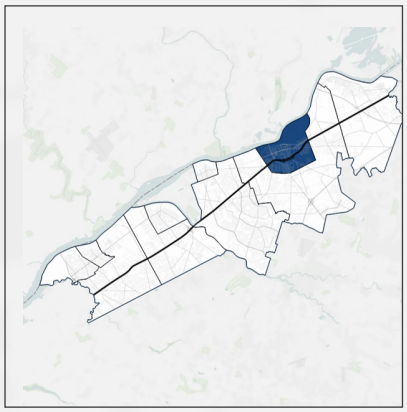


The City of Beverly is extremely grateful for the opportunity to participate in this important planning project. We know all too well how important every dollar is to our community and that is why every capital project must have a cost-benefit analysis and every project must have a sustainability component that addresses items in our long range planning goals. Having a CCRHVA as an overarching policy guide will greatly aid our community in future sustainability projects.

– City of Beverly

FIGURE 6.15: A train arriving at the Beverly / Edgewater Park River Line light rail station. *(Source: Adam Moss, Wikimedia Commons, CC BY-SA 2.0)*

SECTION 6.2: Burlington City CCRHVA



Summary of Vulnerabilities and Resilience Actions for Burlington City

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Burlington City and one of the primary sources of direct risk for assets and residents alike. The majority of Burlington City is flood-exposed, with flood-vulnerable infrastructure concentrated in the central areas.



Sea Level Rise: Sea level rise is a significant and growing concern for Burlington City. Tidal inundation driven by sea level rise is concentrated in the center of the City. The overall extent of sea level rise hazard exposure in the City is high, with a majority of the land exposed to some level of sea level rise.



Heat: Burlington City has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure can be found in the center of the City and are generally caused by high amounts of impervious surfaces and low amounts of green space.



Landslide: Burlington City has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Burlington City is in the north, especially along Burlington Island and along the Delaware River.



Wildfire: Burlington City has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Burlington City is highest on Burlington Island and in the southwest.



Drought: Burlington City has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Burlington City ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Burlington City's vulnerability assessment, and include:

- Mitchell Ave Drainage Pipe Upgrades
- Assiscunk Creek Levee Improvements
- Public Outreach and Education about Flood Risk
- Columbus Rd Drainage Pipe Maintenance
- Stormwater Pump Intake Upgrades
- Scott, Pine, McNeil Sts and Route 130 Drainage Improvements
- Mitchell Ave Pump Station Improvements
- Kennedy Lake Dredging
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Located along the Delaware River and surrounded to the west, south, and east by Burlington Township, Burlington City (the City) is a historic city of 9,904. The City is distinguished by its historic character and higher-density residential neighborhoods surrounding the main commercial street of High St. Assiscunk Creek, which branches off from the Delaware River, cuts through the eastern portion of the City and presents some flood risk. The City contains wetlands and other water features, such as Kennedy Lake. Several landmarks exist in the town, such as Penn's Brew House, Grant House, and the Elias Boudinot School, all of which exist within one of the three listed or designated historic districts in the City, including the Burlington Historic District, the High St Historic District, and the Burlington City Municipal Historic District. The City is served by two River LINE light rail stations. **Table 6.2.1** shows Burlington City's socially vulnerable populations. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.2.1: Socially vulnerable populations in Burlington City.

DEMOGRAPHIC VARIABLE	BURLINGTON CITY	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	9,904	--	9,267,014	--
Total Household Units	4,068	--	3,775,842	--
Occupied Housing Units	3,645	--	3,478,355	--
Vacant Housing Units	423	--	297,487	--
Population 18 or Younger	2,169	21.90%	2,031,322	21.90%
Population 65 or Older	1,481	14.95%	1,559,816	16.83%

DEMOGRAPHIC VARIABLE	BURLINGTON CITY	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Population with a disability	1,225	**12.40%**	975,308	10.60%
Persons without a high school diploma	727	**10.27%**	600,736	9.30%
Persons below poverty level	2,386	**24.12%**	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	**12.50%**	N/A*	6.20%
Persons uninsured	922	**9.30%**	682,266	7.40%
Persons who speak English "less than well"	260	2.80%	562,865	6.44%
Single Parent households	296	**8.12%**	198,943	5.72%
Minority Ethnicity (non-white)	5,752	**58.08%**	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	448	11.01%	639,960	16.95%
Crowded housing units	125	3.43%	129,710	3.73%
Households with no vehicle	340	9.30%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Townships of Burlington and Florence, and Burlington City took place on April 10th, 2025, from 5:15 to 6:45 p.m. Approximately 30 stakeholders attended the meeting, four of whom were affiliated with Burlington City.

Attendees from Burlington City were primarily concerned with issues of flooding from increased precipitation levels and subsequent water pollution and home insurance costs. When asked about climate concerns and hazards observed in their community, stakeholders shared that they see higher instances of flooding and debris clogging storm drains as primary concerns. Problem areas identified include

parking lots, stores, downtown parks near the river, and Route 130 and High St. Respondents indicated that their most valuable community assets include county parks, Main St, the historic downtown area, and municipal and EMS facilities such as fire and police stations and hospitals, in addition to a local military facility. Resilience to residents in Burlington City means having access to shelter in the face of climate change-related disasters, implementing measures and infrastructure enhancements to reduce flooding and flood impact, and prioritizing healthier habitats for local wildlife in the community.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

Two attendees were from Burlington City. Feedback related to Burlington City mentioned the need for resources to support resiliency planning and projects. Commenters would like to see programs to support private actions and large-scale community projects. Secondary benefits commenters want to see are improved public infrastructure, jobs, and economic activity.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Burlington City, Burlington Township, and Florence in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Burlington City.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed. The draft policy statements were also reviewed.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information, and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Burlington City representatives noted that the greatest concern is flooding, as 80% of the City is in the floodplain. The City noted it is interested in pursuing big projects, though they would need outside funding. The City representatives discussed eight possible resilience actions, (1) Mitchell Ave drainage pipe upgrades, (2) Columbus Rd drainage pipe upgrade, (3) Assiscunk Levee, (4) replacement of the sewage treatment plant's two stormwater pumps, (5) Kennedy Lake dredging, (6) expanding the size of the drainage pipe for certain streets, (7) Mitchell Ave pump station improvements, and (8) education and support of residents elevating their homes.

Map and Survey Comments

The Project Team received 45 points of information for Burlington City, noting problem areas, resilience projects, assets, climate concerns, and resilience visioning. Flooding and poor drainage were common themes. Heat, ecology, and development patterns were also noted. Commenters noted historic districts and buildings, homes, promenades, leafy trees, the water plant, sewer plant, City Hall, Kennedy Park, Rt. 130, and bridges

MAP COMMENTS

- **Salem Rd off of Burlington Pike** was identified as a problem area with excessive heat / no shade.
- **Iris Ln** was identified as an area where a potential resilience project could be implemented to help with drainage.
- **High St Historic District** was identified as an area where a potential resilience project could be implemented to help with urban greening.

ONLINE FORM COMMENTS

- Problem area identified at the **Delaware Riverfront and Assiscunk Creek**. Water backing up in drainage pipes flooding a few neighborhoods, as weak as Kennedy Park, Keim Blvd at rt 130 and McNeil at Rt. 130.
- Problem area identified at the **Promenade at the Delaware River**. Poor drainage at intersections was commented on as well as older and diseased trees that need to be replaced to mitigate heat islands.

RESILIENCE VISIONING COMMENTS

Imagine a future 50 years away. What do you hope to see in Burlington County?

A better public transportation network to connect all parts of the county. Consolidation of small towns and school districts.

Stable infrastructure.

What does a resilient Burlington County look like to you?

Houses with storm proof roofs, more heating and cooling systems moved to upper floors, healthy parks, storm water management, more solar energy, reinforced electrical poles, streets and sidewalks that are paved with porous material, more transit and rail, water safety, retrofitting buildings.

Preparation of communities for flooding, guard against impacts from natural disasters.

The ability to handle the stress of extreme weather events and bounce back quickly from being overwhelmed.

across waterways as community assets. Commenters envisioned a future that includes a countywide public transportation network, consolidation of small towns and school districts, stable infrastructure, better stormwater management, more resilient and sustainable buildings and infrastructure, and emergency preparedness.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

FIGURE 6.2.1: Burlington Station on the RiverLINE Light Rail Line in Burlington City. *(Source: NJTOD)*



Flooding

Flooding is a significant area of concern for residents and community leaders in Burlington City and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of Burlington City is flood-exposed, with a concentration in the central areas. These areas represent 77% of the land area in the City, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the City (89%) is within a modeled floodplain used in this analysis.

Figure 6.2.2 shows the spatial distribution of flood vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.2.2: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

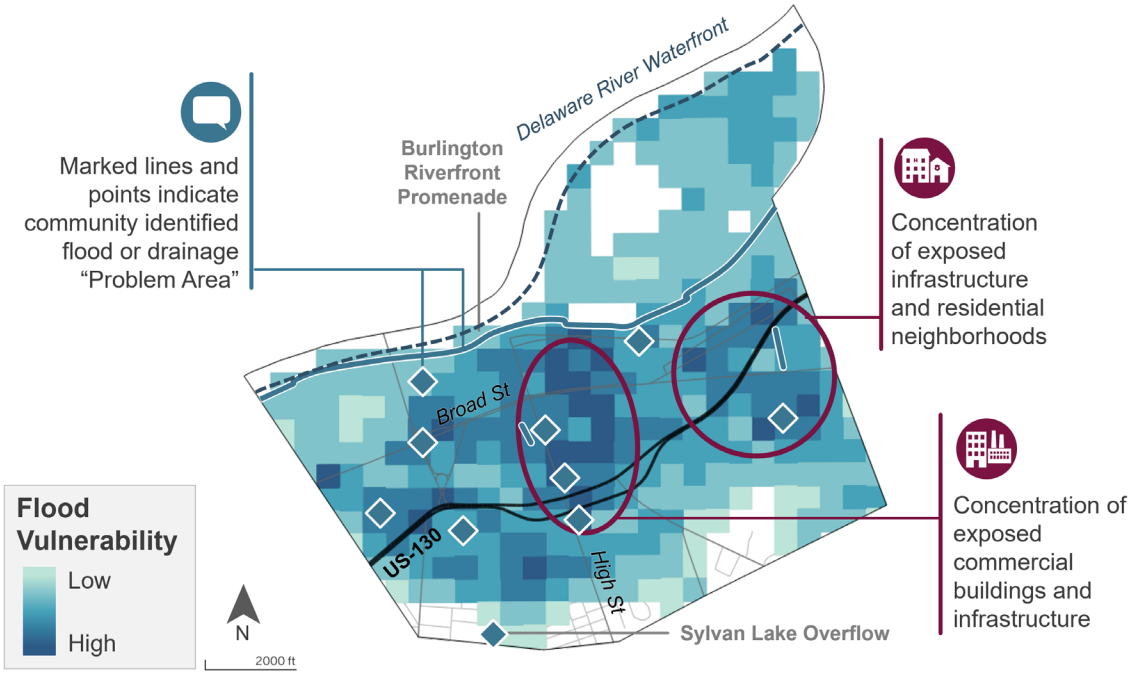
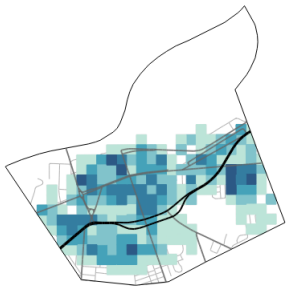


FIGURE 6.2.3: Flood exposure for four themes in Burlington City.



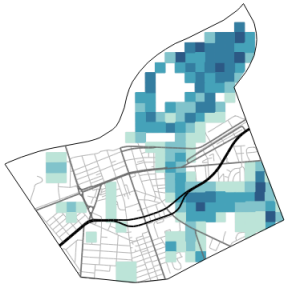
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Burlington City, approximately 70% of the residential buildings in the City are classified as having high flood exposure (within a 1% annual chance floodplain today), and 84%, or 312, of the 370 public and commercial buildings have high exposure, spread throughout the City. Notable flood-exposed buildings include the Library Company of Burlington, Burlington City High School, Captain James Lawrence Elementary School, and all four community centers. Three acres of agricultural land also have high flood exposure, all in the southeast.



CRITICAL INFRASTRUCTURE

In Burlington City, 81% of utility infrastructure and 89% of health and emergency service facilities have a high exposure to flooding, including the Burlington Police Department and the Burlington City Health Center. Additionally, the Burlington City Recycling Yard and Param Petroleum are exposed to flooding, with the potential for releases resulting in public health concerns and environmental damage. Forty-two miles of transportation routes in the City also have high flood exposure, and 5 miles of those are evacuation routes. US Highway 130 has the highest mileage exposed, with approximately 4.4 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Burlington City, 237 acres, or 69%, of forests and shrublands are exposed to high levels of flooding, primarily in the north on Burlington Island. Similarly, 89% of wildlife habitat areas and 80% of wetlands are also within high flood exposure areas, primarily in the north on Burlington Island and in the southeast around Assiscunk Creek. Wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the center of the City have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. With most residential buildings in the floodplain, flooding along the Delaware River and Assiscunk Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.2.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.2.2: Distribution of flood exposure scores for land area and assets in Burlington City based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	1,920 Acres	222 (12%)	32 (2%)	191 (10%)	1,476 (77%)
Community Resources					
Residential Buildings	2,199 Assets	362 (16%)	44 (2%)	257 (12%)	1,536 (70%)
Public & Commercial Buildings	370 Assets	17 (5%)	2 (1%)	39 (11%)	312 (84%)
Agricultural Land	3 Acres	--	--	--	3 (100%)
Critical Infrastructure					
Utility Infrastructure	7 Assets	--	1 (2%)	8 (17%)	38 (81%)
Health & Emergency Services	5 Assets	--	1 (11%)	--	8 (89%)
Hazardous Material Sites	3 Assets	3 (11%)	1 (4%)	3 (11%)	21 (75%)
Transportation Routes	13 Miles	6 (11%)	0.7 (1%)	5 (9%)	42 (79%)
Evacuation Routes	5 Miles	0.2 (4%)	--	0.3 (6%)	5 (94%)
Natural Infrastructure					
Forests & Shrubland	29 Acres	30 (9%)	11 (3%)	66 (19%)	237 (69%)
Wildlife Habitat Areas	780 Acres	29 (4%)	11 (1%)	47 (6%)	693 (89%)
Wetlands	10 Acres	21 (17%)	0.2 (<1%)	3 (2%)	95 (80%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a significant and growing concern for Burlington City. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware and the Assiscunk Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the center of the City. Across the City, 357 acres, or 19%, of land area is modeled as exposed to present-day tidal inundation. The overall extent sea level rise hazard exposure in the City is high, with a majority of the land exposed to some level of sea level rise. Around the end of the century, 63% of the land area in the City may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.2.4 shows the spatial distribution of sea level rise vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.2.4: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

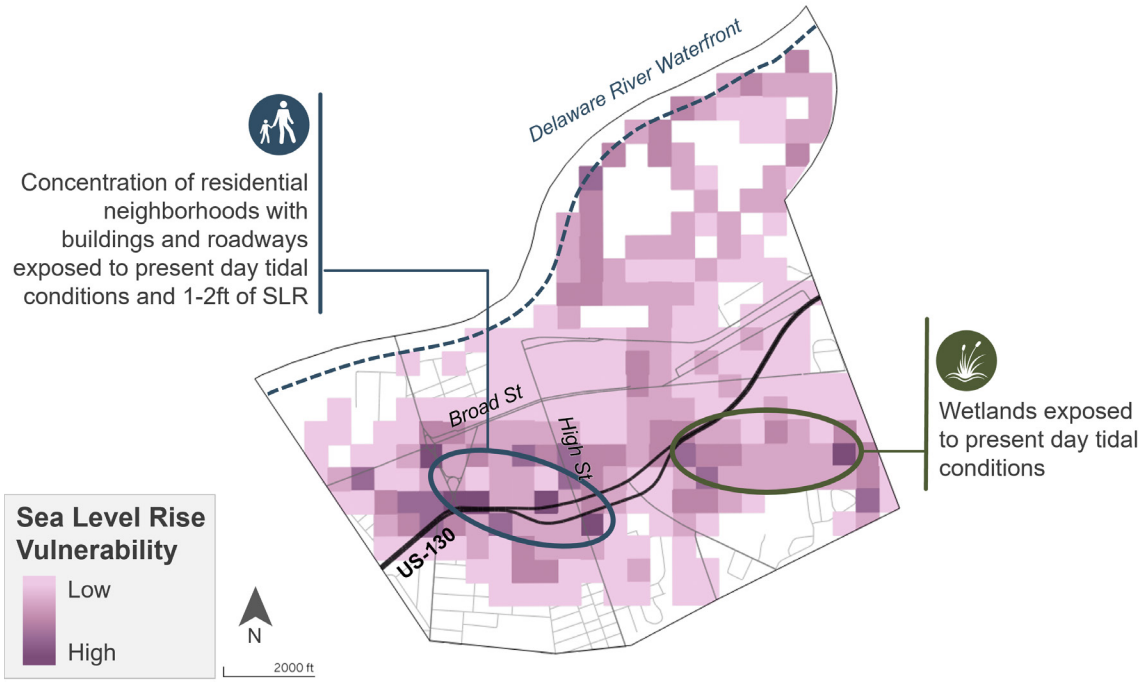
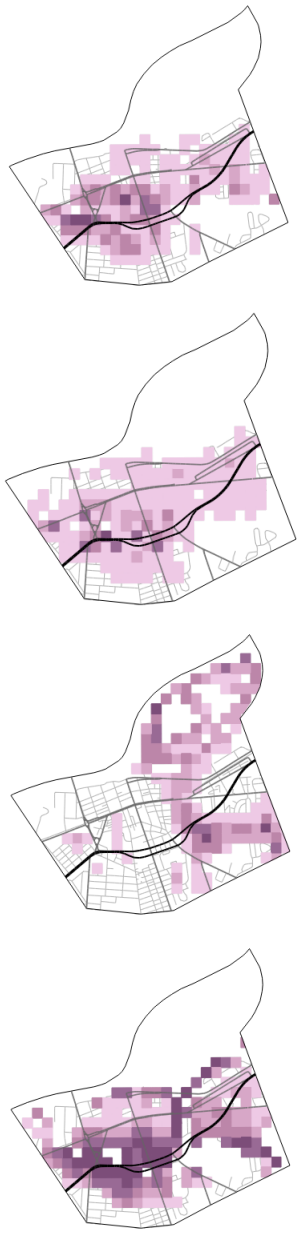


FIGURE 6.2.5: Sea level rise exposure for four themes in Burlington City.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Burlington City, 439 homes and 148 public and commercial buildings would be exposed at three feet of sea level rise, and 1,002 homes and 241 public and commercial buildings would be exposed at five feet of sea level rise. These buildings are concentrated at the intersection of Engle Ave and Juniper St, Greenwood Ave, and along the banks of the Assiscunk Creek; they include multiple municipal buildings and community centers, as well as the Library Company of Burlington and Wilbur Watts Intermediate School. Additionally, only 3 acres of agricultural land in the southeast near the Assiscunk Creek, are exposed at five feet of sea level rise.

CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Burlington City, 37 critical infrastructure assets and 4.9 roadway miles are exposed to 4-5 feet of tidal inundation. This includes multiple firehouses, schools, pharmacies, gas stations, sewage treatment plants, and known contaminated sites.

NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels—wetlands are known to migrate inland with rising sea levels if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 81 acres, representing 68%, of wetlands in the City are exposed to 4-5 feet of tidal inundation, localized around Burlington Island and the shore of the Assiscunk Creek. Similarly, 49% of forests and shrublands, and 78% of wildlife habitat areas are exposed under the same conditions.

SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts along the shore of the Assiscunk Creek and the Delaware have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.2.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.2.3: Distribution of sea level rise exposure scores for land area and assets in Burlington City based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	1,920 Acres	716 (37%)	200 (10%)	199 (105)	195 (10%)	134 (7%)	120 (6%)	357 (19%)
Community Resources								
Residential Buildings	2,199 Assets	1,197 (54%)	311 (14%)	252 (11%)	135 (6%)	158 (7%)	83 (4%)	63 (3%)
Public & Commercial Buildings	370 Assets	129 (35%)	53 (14%)	40 (11%)	43 (12%)	49 (13%)	33 (9%)	23 (6%)
Agricultural Land	3 Acres	--	0 (1%)	1 (30%)	0.8 (22%)	0.7 (21%)	--	0.9 (26%)
Preserved Farmland	0 Acres	--	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	47 Assets	28 (60%)	7 (15%)	3 (6%)	--	5 (11%)	3 (6%)	1 (2%)
Health & Emergency Services	9 Assets	2 (22%)	1 (11%)	--	2 (22%)	3 (33%)	1 (11%)	--
Hazardous Material Sites	28 Assets	17 (61%)	1 (4%)	--	4 (14%)	3 (11%)	1 (4%)	2 (7%)
Transportation Routes	53 Miles	19 (37%)	9 (17%)	7 (12%)	5 (10%)	5 (9%)	4 (8%)	4 (8%)
Evacuation Routes	5 Miles	0.1 (17%)	1 (22%)	0.6 (12%)	0.4 (7%)	0.7 (13%)	0.7 (14%)	0.8 (15%)
Natural Infrastructure								
Forests & Shrubland	344 Acres	175 (51%)	22 (6%)	17 (5%)	12 (4%)	16 (5%)	6 (2%)	96 (28%)
Wildlife Habitat Areas	780 Acres	172 (22%)	39 (5%)	43 (6%)	33 (4%)	26 (3%)	11 (1%)	455 (58%)
Wetlands	119 Acres	38 (32%)	5 (4%)	7 (6%)	2 (1%)	0.5 (<1%)	1 (1%)	65 (55%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Burlington City has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the City. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure can be found in the center of the City. These high-heat areas are generally caused by high amounts of impervious surfaces and low amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 2% of the land area in the City has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 25% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.2.6 shows the spatial distribution of heat vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.2.6: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

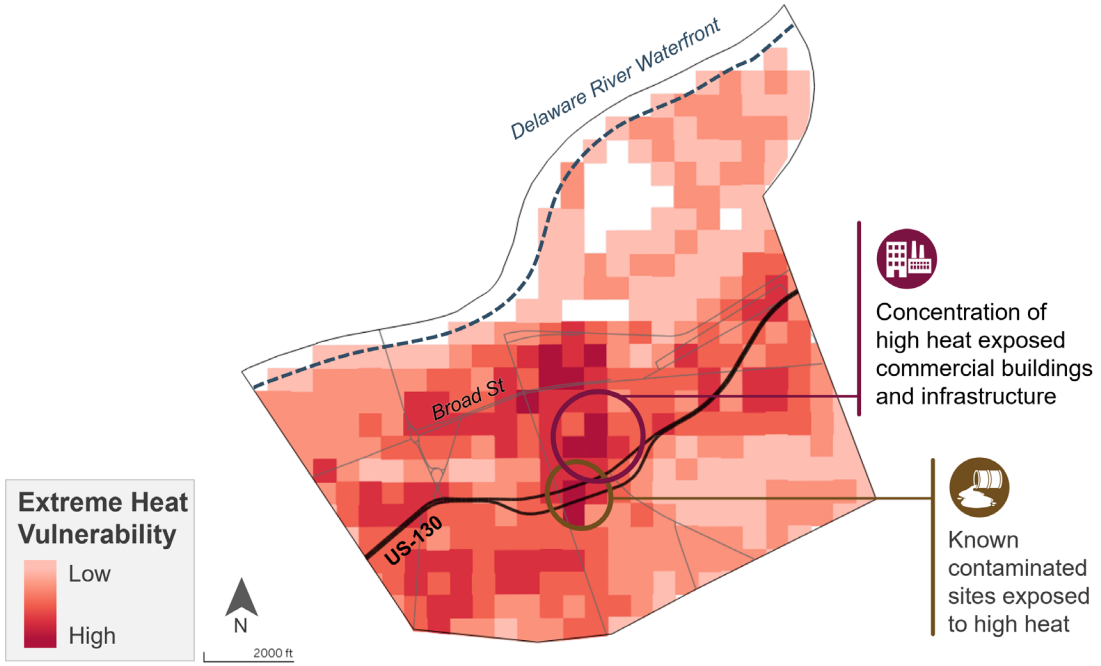
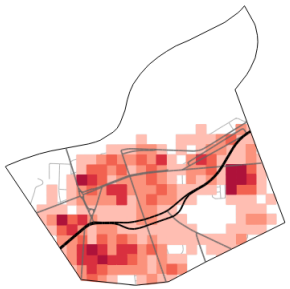
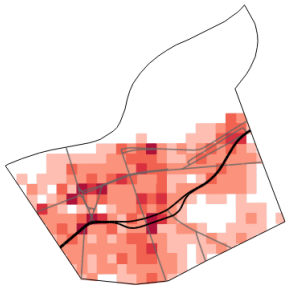


FIGURE 6.2.7: Heat exposure for four themes in Burlington City.



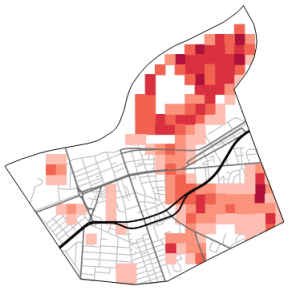
COMMUNITY RESOURCES

In Burlington City, less than 1% of residential buildings and 4% of public and commercial buildings have at least moderate-high heat exposure, mostly concentrated in the center of the City between High St and York St. One public or commercial building has particularly high measured heat exposure, which is an industrial warehouse for MA Imports. While these buildings are unlikely to be directly damaged by high temperatures (e.g. the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



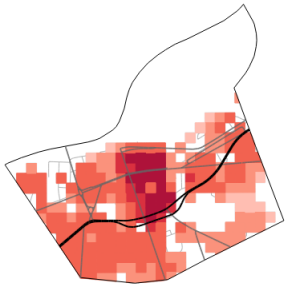
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 2% of utility infrastructure, 7% of hazardous material sites, and 3% of transportation routes have at least moderate-high heat exposure, concentrated in the center of the City between High St and York St. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Burlington City, less than 1% of forests and shrublands, 18% of wetlands, and 19% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are concentrated on Burlington Island and in the southeast corner of the City.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the center of the City have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.2.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.2.4: Distribution of heat exposure scores for land area and assets in Burlington City based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	1,920 Acres	476 (25%)	578 (30%)	831 (43%)	35 (2%)	1 (<1%)
Community Resources						
Residential Buildings	2,199 Assets	25 (1%)	672 (31%)	1,499 (68%)	3 (<1%)	--
Public & Commercial Buildings	370 Assets	6 (2%)	85 (23%)	264 (71%)	14 (4%)	1 (<1%)
Agricultural Land	3 Acres	2 (69%)	1 (31%)	--	--	--
Critical Infrastructure						
Utility Infrastructure	47 Assets	2 (4%)	18 (38%)	26 (55%)	1 (2%)	--
Health & Emergency Services	9 Assets	--	1 (11%)	8 (89%)	--	--
Hazardous Material Sites	28 Assets	2 (7%)	7 (25%)	17 (61%)	2 (7%)	--
Transportation Routes	53 Miles	0.5 (1%)	12 (23%)	39 (73%)	2 (3%)	--
Evacuation Routes	5 Miles	0.1 (2%)	0.6 (10%)	4 (81%)	0.4 (7%)	--
Natural Infrastructure						
Forests & Shrubland	344 Acres	--	0.6 (<1%)	76 (22%)	188 (55%)	79 (23%)
Wildlife Habitat Areas	780 Acres	112 (14%)	40 (5%)	162 (21%)	268 (34%)	198 (25%)
Wetlands	119 Acres	--	21 (18%)	38 (32%)	47 (39%)	14 (11%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Burlington City has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Burlington City is in the north, especially along Burlington Island and along the Delaware River. Overall, 10% of the land area in the City is considered exposed to landslides.

Figure 6.2.8 shows the spatial distribution of landslide vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.2.8: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

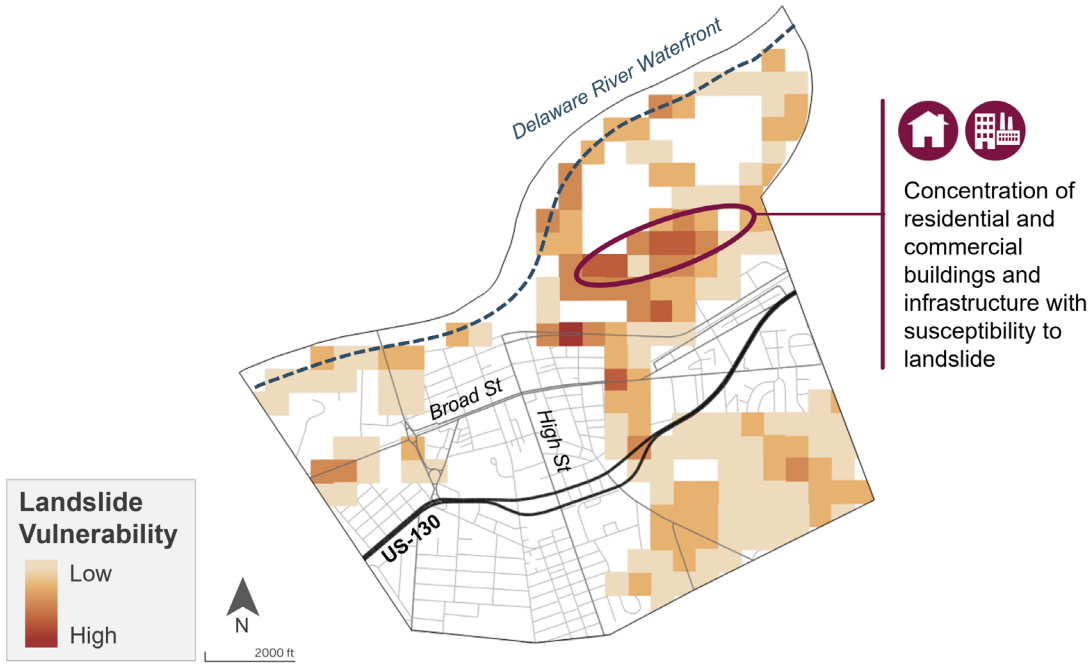


FIGURE 6.2.9: Landslide exposure for four themes in Burlington City.



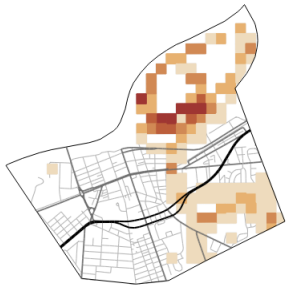
COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the City are outside of areas modeled as susceptible to landslides. Only 5% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.08% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the north.



CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the City is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include a land mobile private tower and a port facility. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides include Columbus Rd.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 197 acres, or 42%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 7% of forests and shrubland and 7% of wetlands have between moderate and high exposure. Similarly, 387, or 50%, of wildlife habitat areas also have known landslide exposure. These areas are concentrated on Burlington Island.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the center of the City have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include those along the shore of the Assiscunk Creek.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.2.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.2.5: Distribution of landslide exposure scores for land area and assets in Burlington City based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	1,920 Acres	1,567 (82%)	175 (9%)	144 (8%)	35 (2%)	--	--
Community Resources							
Residential Buildings	2,199 Assets	2,116 (96%)	59 (3%)	22 (1%)	2 (<1%)	--	--
Public & Commercial Buildings	370 Assets	337 (91%)	21 (6%)	12 (3%)	--	--	--
Agricultural Land	3 Acres	2 (63%)	0.3 (8%)	1 (30%)	--	--	--
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	47 Assets	29 (62%)	11 (23%)	7 (15%)	--	--	--
Health & Emergency Services	9 Assets	9 (100%)	--	--	--	--	--
Hazardous Material Sites	28 Assets	22 (79%)	4 (14%)	2 (7%)	--	--	--
Transportation Routes	53 Miles	48 (89%)	4 (8%)	1 (3%)	0.1 (<1%)	--	--
Evacuation Routes	5 Miles	5 (89%)	0.4 (8%)	0.2 (3%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	344 Acres	199 (58%)	61 (59%)	59 (17%)	25 (7%)	--	--
Wildlife Habitat Areas	780 Acres	393 (50%)	162 (21%)	163 (21%)	62 (8%)	--	--
Wetlands	119 Acres	68 (57%)	25 (21%)	18 (16%)	8 (7%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Burlington City has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Burlington City is not particularly high, wildfires are more likely in surrounding areas, such as the southeastern parts of Burlington County. Even if infrastructure in Burlington City is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Burlington City is highest on Burlington Island and in the southwest. These areas of relatively higher wildfire hazard potential are mostly forest and wetlands with limited agricultural areas. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Across the City, 2% of land area has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.2.10: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

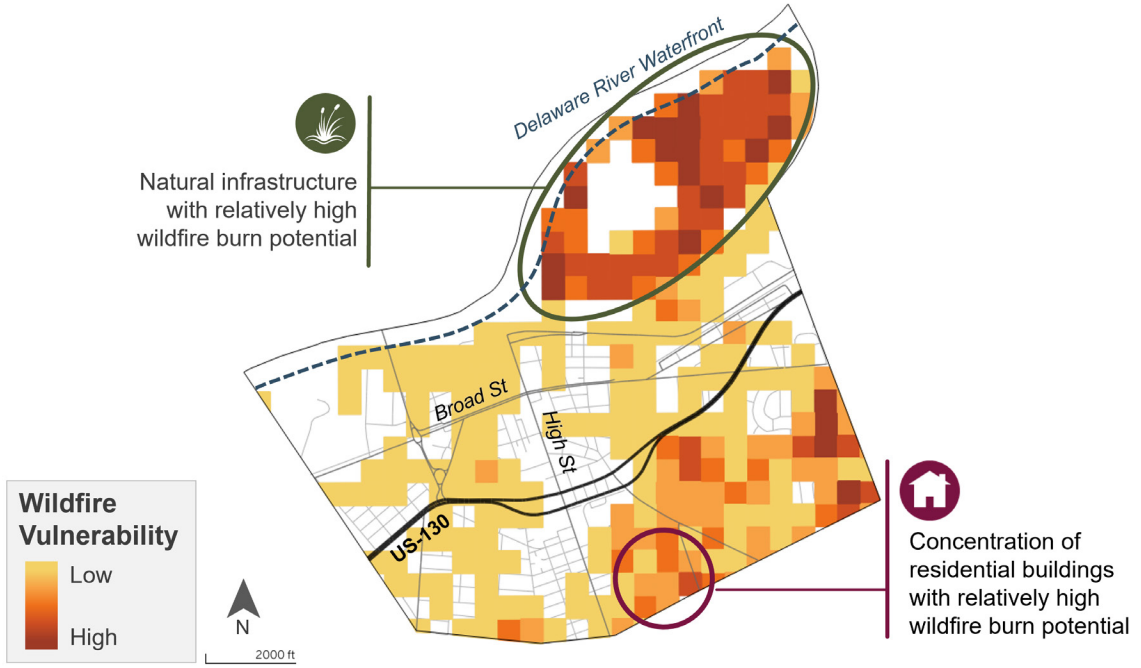


Figure 6.2.10 shows the spatial distribution of wildfire vulnerability across the city, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.2.11: Wildfire exposure for four themes in Burlington City.



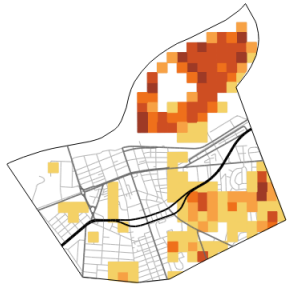
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Burlington City are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas and forests are most likely to face risk of wildfire exposure, such as in the southeast with proximity to some green space. Areas with higher density urban development, meanwhile, have lower exposure. Across the City, 14 buildings have an annual likelihood of burning of at least 0.05%. The 3 acres of agricultural lands have between a 0.03% and 0.05% annual likelihood of burning.



CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the City do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas include a Land Mobile Private Towers Communication System, Gasko Lumberton Mobile Service Station, and a sewage disposal facility. Roadways in more wildfire-prone areas include the Burlington Bypass and E 7th St. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and wetlands in the southwest and on Burlington Island have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Burlington City communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Burlington City in surrounding areas can still cause harm to Burlington City residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the southeast and at or near Burlington Island have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.2.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.2.6: Distribution of heat exposure scores for land area and assets in Burlington City based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	1,920 Acres	1,264 (66%)	67 (3%)	75 (4%)	484 (25%)	32 (2%)	--
Community Resources							
Residential Buildings	2,199 Assets	2,078 (94%)	41 (2%)	30 (1%)	37 (2%)	13 (1%)	--
Public & Commercial Buildings	370 Assets	353 (95%)	5 (1%)	5 (1%)	6 (2%)	1 (<1%)	--
Agricultural Land	3 Acres	--	--	--	3 (100%)	--	--
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	47 Assets	45 (96%)	1 (2%)	--	1 (2%)	--	--
Health & Emergency Services	9 Assets	9 (100%)	--	--	--	--	--
Hazardous Material Sites	28 Assets	24 (86%)	--	2 (7%)	1 (4%)	1 (4%)	--
Transportation Routes	53 Miles	51 (96%)	0.4 (1%)	1 (2%)	0.6 (1%)	0 (<1%)	--
Evacuation Routes	5 Miles	5 (98%)	--	0.1 (2%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	344 Acres	31 (9%)	7 (2%)	10 (3%)	286 (83%)	10 (3%)	--
Wildlife Habitat Areas	780 Acres	321 (41%)	1 (<1%)	9 (1%)	436 (56%)	13 (2%)	--
Wetlands	119 Acres	6 (5%)	4 (4%)	3 (3%)	98 (83%)	7 (6%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Burlington City has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Burlington City ranges from slightly drought-vulnerable to drought-vulnerable land. The majority of the land area in the City (96%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes are distributed throughout the City.

FIGURE 6.2.12: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington City.

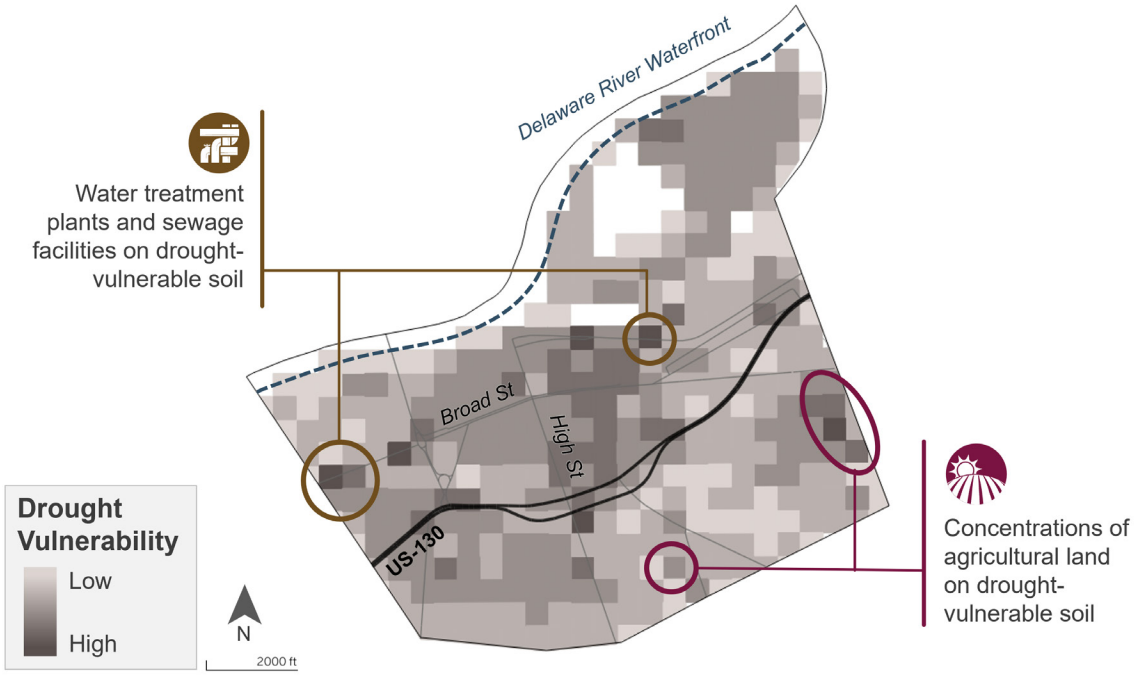


Figure 6.2.12 shows the spatial distribution of drought vulnerability across the City, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.2.13: Drought exposure for four themes in Burlington City.



COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. All agricultural land in the City is on drought-vulnerable soil, concentrated in the southeast. The majority of buildings (74%) are also on land modeled to be drought-vulnerable, concentrated in the western and northern portions of the City. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



CRITICAL INFRASTRUCTURE

The majority of critical infrastructure assets in the City are on drought-sensitive soil. Between 75% and 96% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, spread throughout the northern portion of the City. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. Across Burlington City, 11% of wetlands and 23% of forests and shrublands are modeled to have drought-vulnerable soil.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the western and central portion of the City have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.2.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located..

TABLE 6.2.7: Distribution of drought exposure scores for land area and assets in Burlington City based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	1,920 Acres	--	--	--	13 (4%)	333 (96%)
Community Resources						
Residential Buildings	2,199 Assets	--	5 (<1%)	286 (13%)	326 (15%)	1,582 (72%)
Public & Commercial Buildings	370 Assets	--	--	22 (6%)	21 (6%)	327 (88%)
Agricultural Land	3 Acres	--	--	--	0 (<1%)	3 (100%)
Critical Infrastructure						
Utility Infrastructure	47 Assets	--	--	2 (4%)	--	45 (96%)
Health & Emergency Services	9 Assets	--	--	--	1 (11%)	8 (89%)
Hazardous Material Sites	28 Assets	--	--	4 (14%)	3 (11%)	21 (75%)
Transportation Routes	53 Miles	0.1 (<1%)	--	6 (11%)	6 (12%)	39 (77%)
Evacuation Routes	5 Miles	0.1 (<1%)	--	0.8 (15%)	0.2 (3%)	4 (80%)
Natural Infrastructure						
Forests & Shrubland	344 Acres	--	0.6 (<1%)	76 (22%)	188 (55%)	79 (23%)
Wildlife Habitat Areas	780 Acres	112 (14%)	40 (5%)	162 (21%)	268 (34%)	198 (25%)
Wetlands	119 Acres	--	21 (18%)	38 (32%)	47 (39%)	14 (11%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Burlington City's planning documents reflect a growing recognition of climate change and sustainability, and specific recommendations addressing climate change-related issues have recently become a more integral part of the City's planning process. Climate change concerns have also been addressed in State, county and regional initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- In April 2005, Burlington City adopted its Municipal Stormwater Management Plan. The plan serves as a tool to control runoff, minimize flooding, and protect surface and groundwater quality. It was revised in August 2006 to reflect updated guidance and local conditions.
- The 2010 Master Plan Update emphasizes promoting land use patterns that enhance the City's compact, diversified nature, encourage pedestrian activity, and support transit, aiming to reduce automobile dependence. Specific goals include leveraging the light rail system and improving circulation for various modes of transportation, such as bicycling. These elements indirectly support climate change mitigation by reducing emissions from vehicles and promoting sustainable urban development.
- Chapter 170, Flood Damage Prevention, originally adopted by the Common Council through Ordinance No. 8-1997 and amended in its entirety on September 19, 2017, by Ordinance No. 11-2017, reaffirms Burlington City's dedication to reducing risks associated with flooding. This chapter defines procedures for regulating development in flood-prone areas and codifies the role of the Floodplain Administrator, which is extremely pivotal in Burlington as the majority of the City lies within FEMA Floodplains. The Administrator is responsible for interpreting ordinance provisions and ensuring alignment with NJDEP regulations and local planning policies to safeguard the general welfare.
- The 2021 Master Plan Reexamination marks a more explicit shift towards addressing climate change in local planning documents. It recommends updating the Land Use Plan to include Smart Growth, Climate Change, Sustainability, and Resiliency principles, ensuring the City aligns with recent changes in the MLUL. The Reexamination also recommends incorporating the strategies from the 2017 Burlington City CVA Report into the Master Plan, as well as adopting ordinances for floodplain and stormwater protection, consistent with the New Jersey Department of Environmental Protection's best practices.

COUNTY EFFORTS

- According to the 2024 Burlington

County HMP, Burlington City has a high hazard rating for flood and severe weather; medium ratings for dam failure, disease outbreaks, extreme temperatures, and severe winter weather; and low ratings for drought, earthquakes, and wildfires. The City demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter weather; a moderate capacity in dealing with drought, earthquakes, severe weather, and wildfires; and a weak capacity in dealing with dam failure and flooding.

STATE EFFORTS

- NJDEP's 2014 CVI highlights that majority of the City is classified as moderate-risk and higher-risk areas given the significant waterfront frontage along the Delaware River and Assiscunk Creek. The high-risk areas are located on the eastern and western portions of the municipality around the Route 130 corridor. The moderate-risk areas buffer the high-risk areas and are the predominant CVI classification within the municipality. Three schools, one fire station, and the Burlington South River LINE station are located within higher-risk areas. Three schools, two fire stations, and the law enforcement station are located within moderate-risk areas. The southern portion of the municipality, adjacent to Burlington Township is classified as lower-risk.

REGIONAL EFFORTS

- The 2017 Burlington City CVA Report, prepared by DVRPC, underscores the need for strategies to prepare for flooding caused by storm surges and sea level rise. The CVA outlines several specific recommendations and offers guidance related to climate resilience planning within the City, related to risk and vulnerability assessments, public engagement, planning integration, and hazard mitigation. As part of the risk and vulnerability assessment recommendations, the CVA recommends the City estimate the damages from past or future storms and obtain elevations certificates for the most vulnerable assets, which include the Burlington City High School, Wilbur Watts Intermediate School, the fire building at 545 High St, Mitchell Fire Company, Niagara Hose Company 6, the City Municipal Building, the Wastewater Treatment Plant, the Public Works building, the Water Treatment Plant, and historical buildings owned by the City. The public engagement recommendations include a citywide education and empowerment strategy and high-water mark signs. The CVA recommends the City develop a post-disaster recovery plan, and further recommends updates to the Master Plan, All-Hazards Mitigation Plan, and Stormwater Management Plan related to the identification of sea level rise and coastal hazards and green stormwater infrastructure, respectively. The recommendations related to the implementation of hazard mitigation are robust, including siting emergency facilities, re-examining reference flood elevation, further analysis on flood control structures such as the bulkhead and levee, retrofitting strategies, and willing seller buyouts.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as

TABLE 6.2.8: Burlington City zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-3	3,500 square feet
R-2	7,000 square feet
R-1	9,000 square feet
TRN (Traditional Residential Neighborhood)	3,500 square feet
Mixed-Use and Downtown Zones' Minimum Lot Areas	
TC-1	2,500 square feet
TC-2	3,500 square feet
Commercial Zones' Minimum Lot Areas	
NC-1 (Neighborhood Commercial)	2,500 square feet
HC-1	15,000 square feet
HC-2	15,000 square feet
Industrial Zones' Minimum Lot Areas	
I-1	40,000 square feet
IP	60,000 square feet
Miscellaneous or Special Districts Not Considered in Buildout	
W-1 (Waterfront District)	2,500 square feet
OS-1 (Open Space)	No minimum lot area assigned; excluded from buildout

a planning tool rather than an expected outcome. Burlington City features a compact but varied zoning structure encompassing residential, commercial, industrial, and mixed-use districts. Minimum lot sizes range from 2,500 square feet in the City's Town Center and Neighborhood Commercial zones to 60,000 square feet in the Industrial Park (IP) district. The diversity of lot area requirements reflects Burlington's mix of historic neighborhoods, waterfront redevelopment areas, and long-established employment centers. **Table 6.2.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as special-purpose zoning, the amount of land available for new subdivision can be totaled. Burlington City contains 4,862 parcels and/or land masses across all zoning districts which do not face those restrictions above and has an estimated 33,866,237 square feet (or 777 acres) of unconstrained, potentially developable land which are also not schools, wetlands, right-of-way, nor religious institutions. These values represent the base land inventory prior to applying site-specific limitations

TABLE 6.2.9: Burlington City buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
TC-1	139	587,370.23	13.48	2,500	235
TC-2	63	588,345.14	13.51	3,500	168
TC-2	57	261,190.42	6.00	3,500	75
HC-1	30	1,138,785.45	26.14	15,000	76
HC-1	211	1,810,403.86	41.56	15,000	121
HC-2	90	810,904.41	18.62	15,000	54
HC-2	70	2,222,833.00	51.03	15,000	148
I-1	4	2,599,833.75	59.68	40,000	65
I-1	2	2,715,874.89	62.35	40,000	68
I-1	2	22,523.81	0.52	40,000	1
IP	3	140,852.83	3.23	60,000	2
IP	3	1,085,208.69	24.91	60,000	18
NC-1	57	219,376.47	5.04	2,500	88
R-1	124	1,733,332.73	39.79	9,000	193
R-2	248	950,428.41	21.82	7,000	136
R-2	783	5,709,096.81	131.06	7,000	816
R-2	385	2,552,749.47	58.60	7,000	365
R-3	1215	3,433,257.24	78.82	3,500	981
R-3	291	1,238,846.71	28.44	3,500	354
TRN	4	13,593.28	0.31	3,500	4
TRN	224	802,588.60	18.42	3,500	229
TRN	127	629,994.02	14.46	3,500	180
TRN	681	1,578,773.32	36.24	3,500	451
W-1	44	1,020,074.20	23.42	2,500	408

* *Maximum buildout hypothetical*

and serve as a starting point for calculating theoretical buildout capacity using the zones' minimum lot area requirements.

Burlington City's buildout analysis identifies the W-1 and I-1 industrial zones as having the highest remaining development capacity, as shown in **Table 6.2.9**. The W-1 zone, which permits lots with a minimum area of just 2,500 square feet, has land available for an estimated 408 lots, whereas only 44 lots exist within the zone today. Two of the City's I-1 zones similarly support a potential for growth, with 132 lots possible between them, where only 6 lots exist today across both zones. This potential for growth, especially considering the industrial use of the land within the I-1 zone, is typical, as large lots are historically common for industrial operations.

Moderate capacity exists within the City's H-1 and H-2 zones along Route 130 (specifically at the intersections of Route 130 and Logan Ave and Court Dr, respectively), as well as the City's TC-2 Zone along Kiem Blvd and Broad St.

Finally, the residential zone, which has the largest capacity for growth, can be found in the City's lone R-1 district. While being considered a modest buildout in terms of growth potential compared to other nonresidential zones, the R-1 zone carries the largest minimum lot area among residential zones, indicating that the land which comprises the zone could produce some of the largest dwellings within the City should a full buildout be realized.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings, and the areas may be fairly built out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the City prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The City has a few identified redevelopment areas. Current and future vulnerabilities and risks should be considered in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The City has a several redevelopment areas, as noted below.

- McNeal Mansion, US Pipe Site, City Water Treatment Plant, and adjacent vacant parcels – This is along River Rd and Pearl St, near the Amazon site, and the City is working with the State on getting it cleaned up. Once the remedial action work plan is complete, there may be construction, resulting in a mixed-use development. The area is in the NJDEP Brownfield Development Area (BDA) program. The site is approximately 28.6 acres.
- Commerce Square - Burlington Bristol Bridge, Kiem Blvd, and West Broad St, next to the PSE&G building across

from the sewage treatment plant. The site requires environmental remediation prior to any commercial or residential development. The location is approximately 31 acres.

- Senior Housing Development, Linden Ave and Clarkson St Site – This development will be about 66-72units. The site is approximately 0.80 acres.
- Burlington Electronics Site is off of Salem Rd at Route 130 – This site is contaminated but needs to be cleaned up, and it will end up being commercial. The site is approximately 3 acres.

ROUND IV OF AFFORDABLE HOUSING

On January 21, 2025, the Burlington City Common Council adopted Resolution 59-2025 accepting the DCA's estimate that Burlington City has an affordable housing obligation of 63 Present Need units and 30 prospective need affordable housing units.

On or about May 18, 2025, the Joint Land Use Board of the City of Burlington adopted the Housing Element and Fair Share plan. The City plans to use available funds from its Housing Rehabilitation Program revolving loan account to rehabilitate a minimum of five units during Round 4. Additionally, the City has joined the Burlington County Community Development Block Grant (CDBG) Program, which provides a steady source of funding for the rehabilitation of low and moderate-income occupied homes in the City.

The municipality is proposing a total of 39 affordable housing credits through a combination of rental units, bonus credits, and extended affordability controls. This includes 20 low-income family rental units at Commerce Square, which will provide a minimum of four very low-income units. The City is also claiming 10 additional bonus credits for the Commerce Square development, calculated at a rate of 0.5 credits per qualifying unit. Lastly, Burlington Manor will contribute 9 credits through the extension of affordability controls on existing units. All new construction will comply with the NJDEP regulations for flood hazard areas and wetlands.

The Burlington City Common Council endorsed the Housing Element and Fair Share plan by adopting Resolution 167-2025.

Resilience Strategy

Burlington City's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Burlington City.

> Burlington City aims to strengthen its identity as a vibrant, safe, and attractive riverfront community while advancing climate resilience. The City desires to leverage its unique waterfront location and access to regional transportation to promote sustainable economic growth and environmentally responsible development. By encouraging partnerships and investments in green infrastructure, flood mitigation, and transit-oriented projects, Burlington City seeks to protect its historic character and natural resources while preparing

for future climate challenges. As an area of particular concern, Burlington City hopes to navigate the challenges posed by flooding and changes to the base elevation of the Delaware River because flooding has been a consistent consideration and concern throughout Burlington's history. The City is committed to fostering a healthy, thriving community that supports diverse commerce, culture, and quality of life for all residents.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard, and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

BURLINGTON CITY RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

BURLINGTON CITY RESILIENCE ACTION

Mitchell Ave Drainage Pipe Upgrades

This project addresses chronic flooding along Linden Ave and Mitchell Ave. The existing drainage pipes that run along these properties to the creek are compromised, and the outfall gate preventing creek backflow is insufficient. When the creek is high, water backs up, flooding local streets and properties. The City will retrofit existing drainage pipes from Federal St to the creek discharge and repair or replace the outfall gate to prevent backflow into adjacent properties.

RESPONSIBLE PARTY	Burlington City
ESTIMATED COSTS	$2M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

★★★★★

High

BURLINGTON CITY RESILIENCE ACTION

Assiscunk Creek Levee Improvements

The Assiscunk Creek Levee extends from Columbus Park to near the Delaware River. While the section from Columbus Park to Route 130 North has been repaired, the remaining portions require improvement to ensure full flood protection for the surrounding community. This project would clear trees and vegetation along the creek side of the levee to enhance its structural integrity.

RESPONSIBLE PARTY Burlington City

ESTIMATED COSTS $500K

POSSIBLE SOURCE(S) OF FUNDING General Operational Funds, Capital Funds, Grants



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★★★

High

BURLINGTON CITY RESILIENCE ACTION

Public Outreach and Education about Flood Risk

A significant portion of the City lies within a FEMA-designated floodplain, yet many residents are unaware of their flood risk and the requirements associated with property improvements. Although the City participates in the FEMA Community Rating System (CRS), greater outreach is needed to ensure residents understand both their risks and available mitigation options. The City will implement a public outreach campaign to increase awareness of local flood risks and promote property-level mitigation actions. The effort will educate residents about floodplain boundaries, requirements for substantial improvements, and feasible strategies for reducing flood impacts, especially in areas where home elevation is not practical.

RESPONSIBLE PARTY	Burlington City
ESTIMATED COSTS	$10K - $250K+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★★★

High

BURLINGTON CITY RESILIENCE ACTION

Columbus Rd Drainage Pipe Maintenance

The existing pipe that runs from Assiscunk Creek along Columbus Rd (about four blocks long) is old and cracked underground. In addition, when the creek rises, the water backs up into the adjacent neighborhoods. This action will replace existing drainage pipes along Columbus Rd and through City's open space to the creek discharge.

RESPONSIBLE PARTY Burlington City

ESTIMATED COSTS $1M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

5-10 years

PRIORITY RATING

Medium

BURLINGTON CITY RESILIENCE ACTION

Stormwater Pump Intake Upgrades

During storms, stormwater gets deposited into Kennedy Lake; the sewage treatment plant is at the far end of the lake. There is a need to replace the two pumps inside the sewage treatment plant to maximize the utilization of the dual 150HP stormwater pumps during flood events.

RESPONSIBLE PARTY Burlington City

ESTIMATED COSTS $3M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

BURLINGTON CITY RESILIENCE ACTION

Scott, Pine, McNeil Sts and Route 130 Drainage Improvements

Upsize pipes from Scott St to existing 36" RCP on the north side of Route 130, as the current piping size is inadequate.

RESPONSIBLE PARTY Burlington City, Burlington County, NJDOT

ESTIMATED COSTS $1M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

10+ years

PRIORITY RATING

Medium

BURLINGTON CITY RESILIENCE ACTION

Mitchell Ave Pump Station Improvements

The current system cannot handle the increased volume of water that comes off Route 130 during storm events. This action would install a new pump and upsize the force main under Assiscunk Creek.

RESPONSIBLE PARTY Burlington City

ESTIMATED COSTS $1M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

BURLINGTON CITY RESILIENCE ACTION

Kennedy Lake Dredging

Kennedy Lake has not been dredged since the 1950s. This action would dredge the 6.5-acre lake system to a minimum depth of 4 feet.

RESPONSIBLE PARTY Burlington City

ESTIMATED COSTS $5M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

10+ years

PRIORITY RATING

Low



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

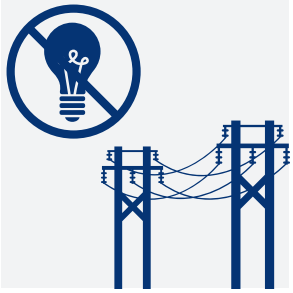


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



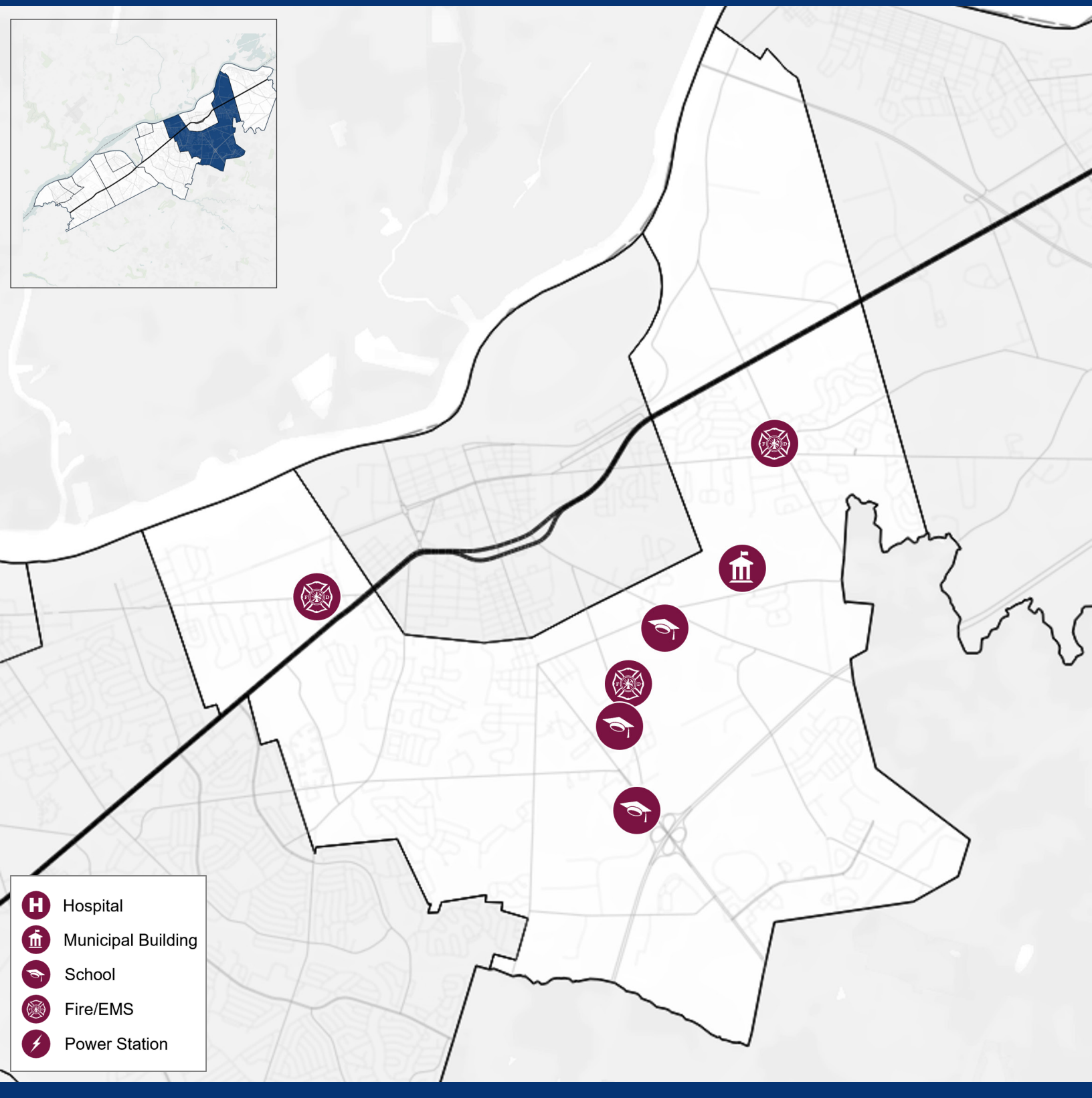
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.3: Burlington Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Burlington Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is an area of moderate concern for residents and community leaders in Burlington Township and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Burlington Township is along the Assiscunk Creek and the Delaware River in the north.



Sea Level Rise: Sea level rise is a small but growing concern for Burlington Township. The overall extent of sea level rise hazard exposure in the Township is fairly low, but tidal inundation driven by sea level rise is concentrated in the north, especially on the east side.



Heat: Burlington Township has an overall high risk of extreme heat compared to other hazards. Areas with high heat exposure can be found spread throughout the Township, but with some concentrations in the western portion, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Burlington Township has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Burlington Township is in the south, especially in the eastern half.



Wildfire: Burlington Township has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. Wildfire potential in Burlington Township is highest in the southeast.



Drought: Burlington Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Burlington Township ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Burlington Township's vulnerability assessment, and include:

- Relocation of Public Works Facilities Outside of Designated Flood Hazard Areas
- Backup Power for Critical Infrastructure
- Assistance for Residents on Flooding Streets
- Mitigation of Central Ave Sewage Treatment Plant
- Preserve Dedicated Open Space
- Encourage the Use of Stormwater Management Best Management Practices (BMPs)
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Located between Florence Township and Edgewater Park, Burlington Township (the Township) is shaped like a horseshoe surrounding Burlington City. Burlington Township contains a population of 23,981 people, and fronts the Delaware River to the west and east of Burlington City. The northern portion of the Township contains predominantly lower-density residential uses, while the southern portions along Interstate-295 contain industrial uses, office parks, and strip mall commercial retail. The Assiscunk Creek traverses the eastern portion of the Township, which abuts parkland and recreational areas. The River LINE light rail travels through the Township, though no stations are located within the Township. **Table 6.3.1** shows Burlington Township's socially vulnerable populations. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.3.1: Socially vulnerable populations in Burlington Township.

DEMOGRAPHIC VARIABLE	BURLINGTON TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	23,981	--	9,267,014	--
Total Household Units	9,407	--	3,775,842	--
Occupied Housing Units	8,942	--	3,478,355	--
Vacant Housing Units	465	--	297,487	--
Population 18 or Younger	4,829	20.10%	2,031,322	21.90%
Population 65 or Older	3,918	16.34%	1,559,816	16.83%

DEMOGRAPHIC VARIABLE	BURLINGTON TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Population with a disability	3,045	**13.00%**	975,308	10.60%
Persons without a high school diploma	1,249	7.19%	600,736	9.30%
Persons below poverty level	2,982	12.71%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	4.70%	N/A*	6.20%
Persons uninsured	1,026	4.40%	682,266	7.40%
Persons who speak English "less than well"	633	2.79%	562,865	6.44%
Single Parent households	555	**6.21%**	198,943	5.72%
Minority Ethnicity (non-white)	13,608	**56.74%**	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	1,779	**18.91%**	639,960	16.95%
Crowded housing units	271	3.03%	129,710	3.73%
Households with no vehicle	781	8.70%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Townships of Burlington and Florence, and Burlington City took place on April 10th, 2025, from 5:15 to 6:45 p.m. Approximately 30 stakeholders attended the meeting, ten of whom were affiliated with Burlington Township.

Attendees from Burlington Township were primarily concerned with issues of sea-level rise and subsequent water quality impacts, higher instances and severity of storms, drought, wildfire, extreme heat, and flooding. When asked about climate concerns and hazards observed in their community, Burlington Township residents and stakeholders shared that

they see pollution from sea-level rise and flooding, rising greenhouse gas emissions, and roadway flooding as their greatest threats. Problem areas identified include Burlington Township- River Rd and River Rd at Bustleton Creek as they are both highly flood-prone. Respondents indicated that their most valuable community assets are schools, parks, farms, and emergency evacuation routes. Resilience to residents in Burlington Township means having the ability and infrastructure as a community to prepare for and withstand climate change-related impacts and events through enhancements to municipal systems and planning processes, especially related to sea level rise and emissions reductions.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

No attendees were from Burlington Township, and no questions/comments or poll results about Burlington Township were received during this meeting.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, town administrators, town engineers, and planning board secretaries from Burlington City, Burlington Township, and Florence in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Burlington Township.

Feedback received at this meeting included more information about where flooding is occurring in the Township. It was noted that older developed areas are experiencing flooding due to undersized, older stormwater systems. While understanding the solution to these flooding issues, the Township noted the difficulty in resolving these issues, as in order to upsize the pipes, streets must be excavated. Other areas in the Township that flood include the areas around smaller creeks (as opposed to areas by the Delaware River).

It was noted that the Township is looking to develop a retention pond; however, this may not be possible due to the elevation. The Township also noted concerns about the potential for damage to utilities during ice storms. Coordination is needed among municipalities, the County, and utilities on the storage of critical infrastructure underground when possible, to prevent loss of power.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, and the key resources identified (i.e., what assets comprise community resources, natural infrastructure, critical infrastructure, and social fabric).

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed. The draft policy statements were also reviewed. Burlington Township municipal officials identified a few resilience actions that focus on coordination with partners outside the Township. They suggested resilience actions such as coordination with utility companies to move utilities underground and thus making the Township less susceptible to power outages from severe weather events. They also noted that the lack of NJDOT culvert maintenance increases flooding in the Township. A potential resilience action could be increased NJDOT maintenance.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information, and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Burlington Township representatives indicated interest in the potential regional actions shared (continuation of road maintenance to respond to climate change impacts, expansion of NJDEP's Blue Acres program, and stream clearing, bank stabilization, and channel restoration). Burlington Township's main concern is flooding, as well as the impacts of ice storms. Three potential resilience actions were discussed: (1) coordination with municipal officials to relocate the public works department, (2) continue to preserve remaining unprotected open space along the Delaware River, Marter Ditch, Tanners Run, Assiscunk Creek, and Bustleton

MAP COMMENTS

- **River Rd at the Bustleton Creek** was identified as a problem area where major flooding has stranded vehicles.
- **Beverly Rd and Route 130** were identified as a problem area with poor drainage and flooding.

RESILIENCE VISIONING COMMENTS

What does a resilient Burlington County look like to you?

It is a County that supports its 40 municipalities by responding to their needs and providing cooperation when requested. It is a two-way relationship that works for the benefit of all the residents and businesses that call it home.

What does resilience mean to you?

Building, creating, and updating infrastructure to support future climate hazards.

It means having the ability to continue to operate as intended during and after a severe natural or man-made event, which results in the loss of life and/or property.

Creek that is vulnerable to flooding, and (3) assistance to residents on flooding streets. The Township noted that they would look into additional actions.

Map and Survey Comments

The Project Team received 24 points of information for Burlington Township, noting problem areas, assets, climate concerns, and resilience visioning. Flooding and poor drainage were common themes. Wind and ice were also noted. Commenters noted town emergency and administrative facilities, infrastructure, historic districts, hospitals, a military base, open space, and development controls. Commenters envisioned a future that includes more trees, no expansion of building footprints, county-municipal collaboration, resilient infrastructure and buildings, and the ability to continue operations under difficult circumstances.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

FIGURE 6.3.1: View of Sylvan Lake in Burlington Township. *(Source: Burlington Township)*



Flooding

Flooding is an area of moderate concern for residents and community leaders in Burlington Township and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Burlington Township is along the Assiscunk Creek and the Delaware River in the north. These areas represent 10% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Township (79%) is not within a modeled floodplain used in this analysis.

FIGURE 6.3.2: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.

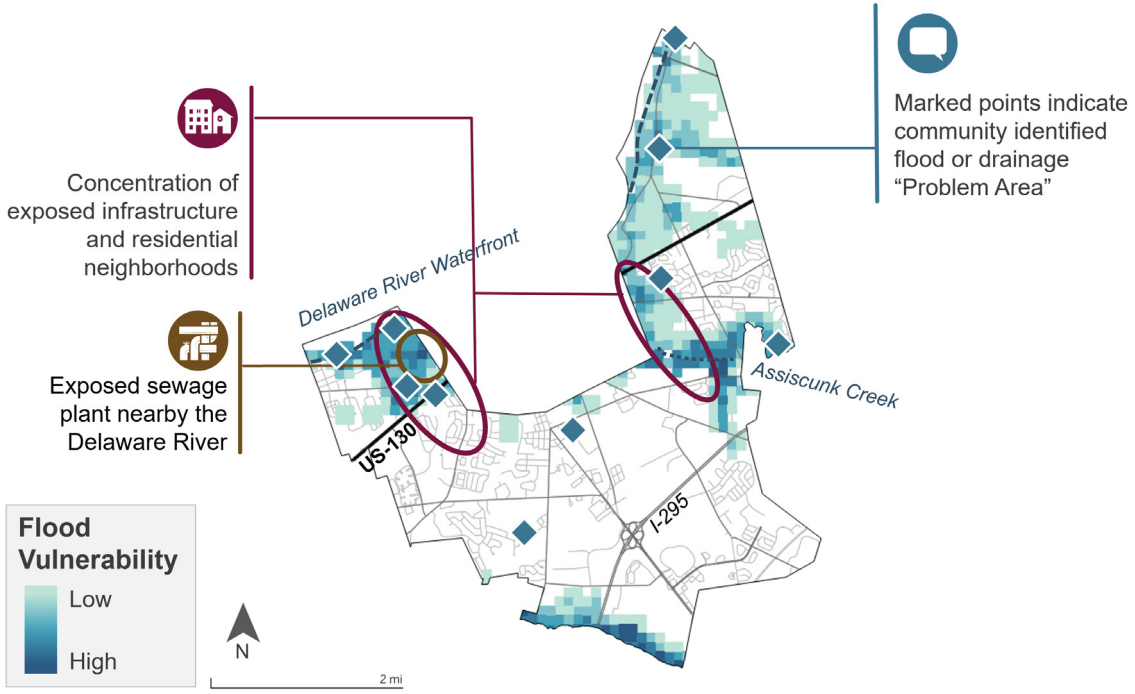


Figure 6.3.2 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.3.3: Flood exposure for four themes in Burlington Township.



COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Burlington Township, approximately 1%, or 59, of the 6,029 residential buildings in the Township, are classified as having high flood exposure (within a 1% annual chance floodplain today), and 2%, or 13, of the 578 public and commercial buildings have high exposure, concentrated in the north. Ten acres of agricultural land in the Township are also considered to have high flood exposure, most of which are in small pockets in the south.

CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Burlington Township, two sewage facilities around Central Ave in the northwest have a high exposure to flooding. Additionally, American Asphalt and PSEG Fossil LLC are hazardous material sites with flood exposure, with the potential for releases resulting in public health concerns and environmental damage. Five miles of transportation routes in the Township also have high flood exposure, and 0.7 miles of those are evacuation routes. River Rd has the highest mileage exposed, with 1.4 miles of roadway exposed to a 1% annual chance flood.

NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Burlington Township, 234 acres, or 15%, of forests and shrublands are exposed to high levels of flooding, in the north and around Assiscunk Creek. Similarly, 20% of wildlife habitat areas and 24% of wetlands are also within high flood exposure areas, mostly situated around Assiscunk Creek. Wetlands are even more resilient to flooding effects than other asset types.

SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the northwest have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Assiscunk Creek and Delaware River may still impact residential populations, especially elderly residents, persons with disabilities, and households with lower income, education, or households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.3.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.3.2: Distribution of flood exposure scores for land area and assets in Burlington Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	8,622 Acres	6,812 (79%)	457 (5%)	470 (5%)	882 (10%)
Community Resources					
Residential Buildings	6,029 Assets	5,611 (93%)	166 (3%)	193 (3%)	59 (1%)
Public & Commercial Buildings	578 Assets	520 (90%)	12 (2%)	33 (6%)	13 (2%)
Agricultural Land	528 Acres	488 (92%)	21 (4%)	9 (2%)	10 (2%)
Critical Infrastructure					
Utility Infrastructure	60 Assets	56 (93%)	--	2 (3%)	2 (3%)
Health & Emergency Services	6 Assets	6 (100%)	--	--	--
Hazardous Material Sites	27 Assets	15 (56%)	2 (7%)	5 (19%)	5 (19%)
Transportation Routes	140 Miles	125 (90%)	3 (2%)	6 (4%)	5 (4%)
Evacuation Routes	13 Miles	12 (90%)	0.1 (1%)	0.5 (4%)	0.7 (5%)
Natural Infrastructure					
Forests & Shrubland	1,551 Acres	1,158 (75%)	85 (5%)	74 (5%)	234 (15%)
Wildlife Habitat Areas	2,365 Acres	1,698 (72%)	120 (5%)	72 (3%)	475 (20%)
Wetlands	1,042 Acres	698 (67%)	70 (7%)	23 (2%)	250 (24%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a small but growing concern for Burlington Township. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally influenced rivers and waterways (such as the Delaware, Assiscunk Creek, and Rancocas Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the north, especially on the east side. Across the Township, 224 acres, or 3%, of land is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is fairly low, as over 90% of land area has no exposure. Around the end of the century, 7% of the land area in the Township may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.3.4 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.3.4: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.



FIGURE 6.3.5: Sea level rise exposure for four themes in Burlington Township.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Burlington Township, zero homes and one public and commercial building would be exposed to tidal inundation at three feet of sea level rise. Seven homes and six public and commercial buildings would be exposed at five feet. These buildings are concentrated near the major rivers. Additionally, only 1.2 acres of agricultural land, centered in the eastern half of the Township with a cluster in the southeast, are exposed to tidal inundation with five feet of sea level rise.

CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Burlington Township, six critical infrastructure assets and 2.82 miles of roadway are exposed to 4-5 feet of tidal inundation. This includes two sewage facilities and Willis Honda.

NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels—wetlands are known to migrate inland with rising sea levels if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 148 acres, representing 14%, of wetlands in the Township are exposed to 4-5 feet of tidal inundation, which are located throughout the lower half of the Township. Similarly, 13% of forests and shrublands and 14% of wildlife habitat areas are exposed under the same conditions.

SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in north which lie along the major waterways have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.3.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.3.3: Distribution of sea level rise exposure scores for land area and assets in Burlington Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	8,622 Acres	8,042 (93%)	118 (1%)	96 (1%)	48 (1%)	43 (1%)	52 (1%)	224 (3%)
Community Resources								
Residential Buildings	6,029 Assets	6,022 (100%)	4 (<1%)	3 (<1%)	--	--	--	--
Public & Commercial Buildings	578 Assets	572 (99%)	1 (<1%)	4 (1%)	--	--	--	1 (<1%)
Agricultural Land	528 Acres	526 (100%)	0.3 (<1%)	0.7 (<1%)	0.2 (<1%)	--	--	--
Preserved Farmland	0 Acres	--	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	60 Assets	58 (97%)	2 (3%)	--	--	--	--	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--	--
Hazardous Material Sites	27 Assets	23 (85%)	3 (11%)	1 (4%)	--	--	--	--
Transportation Routes	140 Miles	137 (98%)	0.8 (1%)	0.9 (1%)	0.5 (<1%)	0.2 (<1%)	0 (<1%)	--
Evacuation Routes	13 Miles	13 (96%)	--	0 (<1%)	--	0.1 (1%)	--	0.3 (3%)
Natural Infrastructure								
Forests & Shrubland	1,551 Acres	1,355 (87%)	39 (3%)	29 (2%)	18 (1%)	18 (1%)	12 (1%)	81 (5%)
Wildlife Habitat Areas	2,365 Acres	2,029 (86%)	32 (1%)	24 (1%)	26 (1%)	20 (1%)	13 (1%)	221 (9%)
Wetlands	1,042 Acres	894 (86%)	6 (1%)	3 (<1%)	10 (1%)	6 (1%)	12 (1%)	110 (11%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Burlington Township has an overall high risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with high heat exposure can be found spread throughout the Township, but with some concentrations in the western portion. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 5% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 33% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.3.6 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.3.6: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.

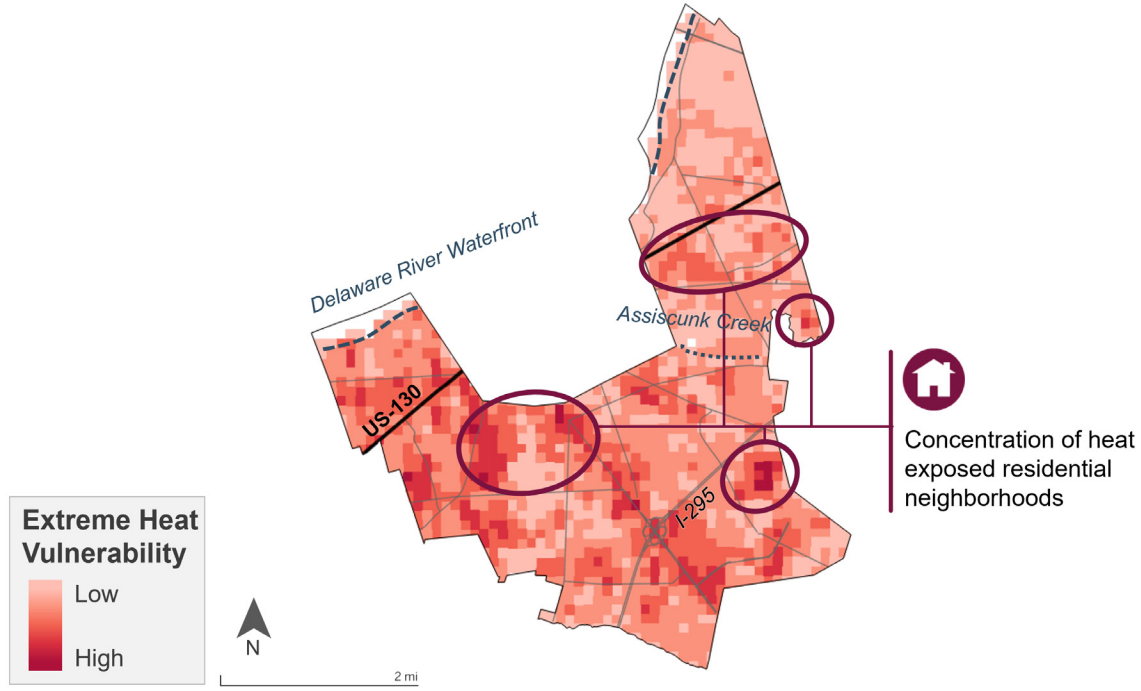
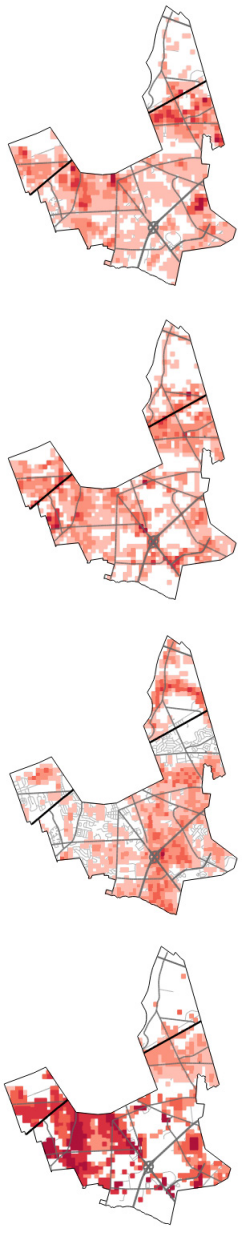


FIGURE 6.3.7: Heat exposure for four themes in Burlington Township.



COMMUNITY RESOURCES

In Burlington Township, less than 1% of residential buildings and 5% of public and commercial buildings have at least moderate-high heat exposure, concentrated mostly in the northeastern portion of the Township. Thirteen public or commercial buildings have particularly high measured heat exposure, including Burlington Township Middle School Springside. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.

CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 15% of utility infrastructure, 18% of hazardous material sites, and 6% of transportation routes in the Township have at least moderate-high heat exposure, concentrated mostly in the northeastern and northwestern corners of the Township. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.

NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Burlington Township, 96% of forests and shrublands, 99% of wetlands, and 95% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are spread throughout the Township with a high concentration in the south.

SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the west and south have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.3.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.3.4: Distribution of heat exposure scores for land area and assets in Burlington Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	8,622 Acres	2,876 (33%)	3,125 (36%)	2,133 (25%)	284 (3%)	204 (2%)
Community Resources						
Residential Buildings	6,029 Assets	370 (6%)	3,315 (55%)	2,336 (39%)	8 (<1%)	--
Public & Commercial Buildings	578 Assets	51 (9%)	215 (37%)	279 (48%)	20 (3%)	13 (2%)
Agricultural Land	528 Acres	318 (60%)	175 (33%)	33 (6%)	0.7 (<1%)	--
Critical Infrastructure						
Utility Infrastructure	60 Assets	4 (7%)	24 (40%)	23 (38%)	4 (7%)	5 (8%)
Health & Emergency Services	6 Assets	--	1 (17%)	5 (83%)	--	--
Hazardous Material Sites	27 Assets	3 (11%)	8 (30%)	11 (41%)	2 (7%)	3 (11%)
Transportation Routes	140 Miles	12 (8%)	60 (43%)	59 (42%)	7 (5%)	1 (1%)
Evacuation Routes	13 Miles	1 (11%)	4 (27%)	7 (54%)	1 (8%)	0 (<1%)
Natural Infrastructure						
Forests & Shrubland	1,551 Acres	1,064 (69%)	414 (27%)	64 (4%)	7 (<1%)	3 (<1%)
Wildlife Habitat Areas	2,365 Acres	1,695 (72%)	551 (23%)	110 (5%)	4 (<1%)	5 (<1%)
Wetlands	1,042 Acres	899 (86%)	135 (13%)	8 (1%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Burlington Township has an overall low risk of landslides compared to other hazards, and while there has not been a documented landslide over the past two decades, it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Burlington Township is in the south, especially in the eastern half. Overall, 17% of the land area in the Township is considered exposed to landslides.

Figure 6.3.8 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.3.8: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.

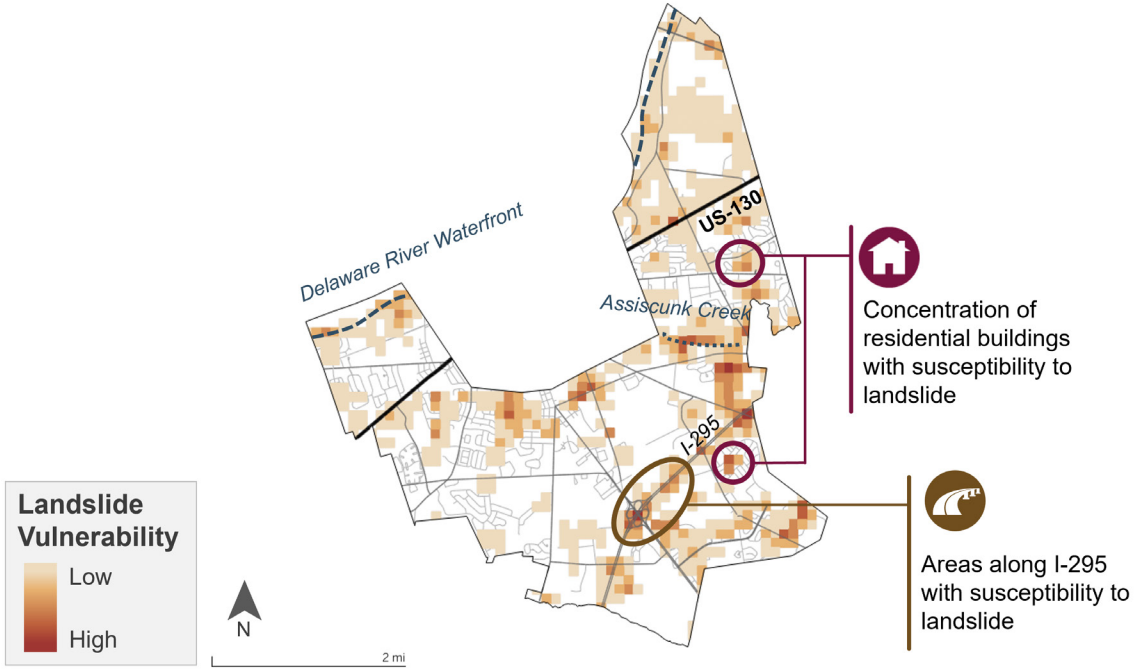
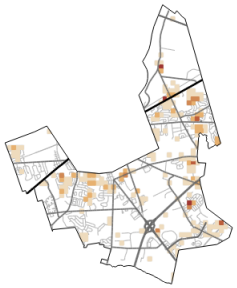
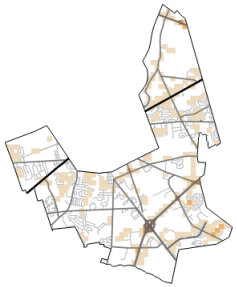


FIGURE 6.3.9: Landslide exposure for four themes in Burlington Township.



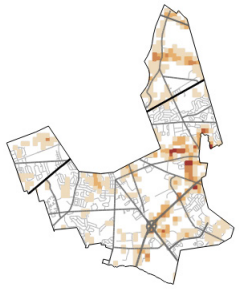
COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 9% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 1% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the east.



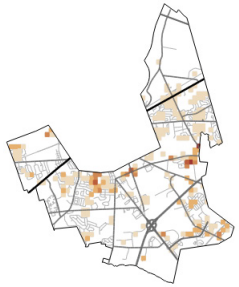
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include the National Gypsum Factory at the Burlington Wharf. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are the NJ Turnpike Extension and Neck Rd.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 580 acres, or 22%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 3% of forests and shrubland and 2% of wetlands have between moderate and high exposure. Similarly, 599, or 25%, of wildlife habitat areas also have known landslide exposure. These areas are mostly in the east.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in south and west have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include those in the southeast.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.3.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.3.5: Distribution of landslide exposure scores for land area and assets in Burlington Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	8,622 Acres	7,137 (83%)	805 (9%)	563 (7%)	89 (1%)	26 (<1%)	--
Community Resources							
Residential Buildings	6,029 Assets	5,495 (91%)	369 (6%)	154 (3%)	11 (<1%)	--	--
Public & Commercial Buildings	578 Assets	519 (90%)	40 (7%)	15 (3%)	4 (1%)	--	--
Agricultural Land	528 Acres	478 (91%)	19 (4%)	26 (5%)	4 (1%)	--	--
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	60 Assets	57 (95%)	3 (5%)	--	--	--	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--
Hazardous Material Sites	27 Assets	23 (85%)	4 (15%)	--	--	--	--
Transportation Routes	140 Miles	110 (79%)	20 (14%)	8 (6%)	0.9 (1%)	0.2 (<1%)	--
Evacuation Routes	13 Miles	9 (65%)	3 (20%)	1 (11%)	0.2 (2%)	0.2 (2%)	--
Natural Infrastructure							
Forests & Shrubland	1,551 Acres	1,156 (75%)	196 (13%)	166 (11%)	26 (2%)	8 (1%)	--
Wildlife Habitat Areas	2,365 Acres	1,766 (75%)	322 (14%)	228 (10%)	42 (2%)	7 (<1%)	--
Wetlands	1,042 Acres	858 (82%)	100 (10%)	67 (6%)	17 (2%)	0.2 (<1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Burlington Township has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Burlington Township is not particularly high, wildfires are more likely in surrounding areas, such as the southeastern parts of Burlington County. Even if infrastructure in Burlington Township is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Burlington Township is highest in the southeast. These areas of relatively higher wildfire hazard potential are wildlife habitats with equal coverage of forests and shrublands and wetlands. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. 19% of land area in the Township has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.3.10: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.

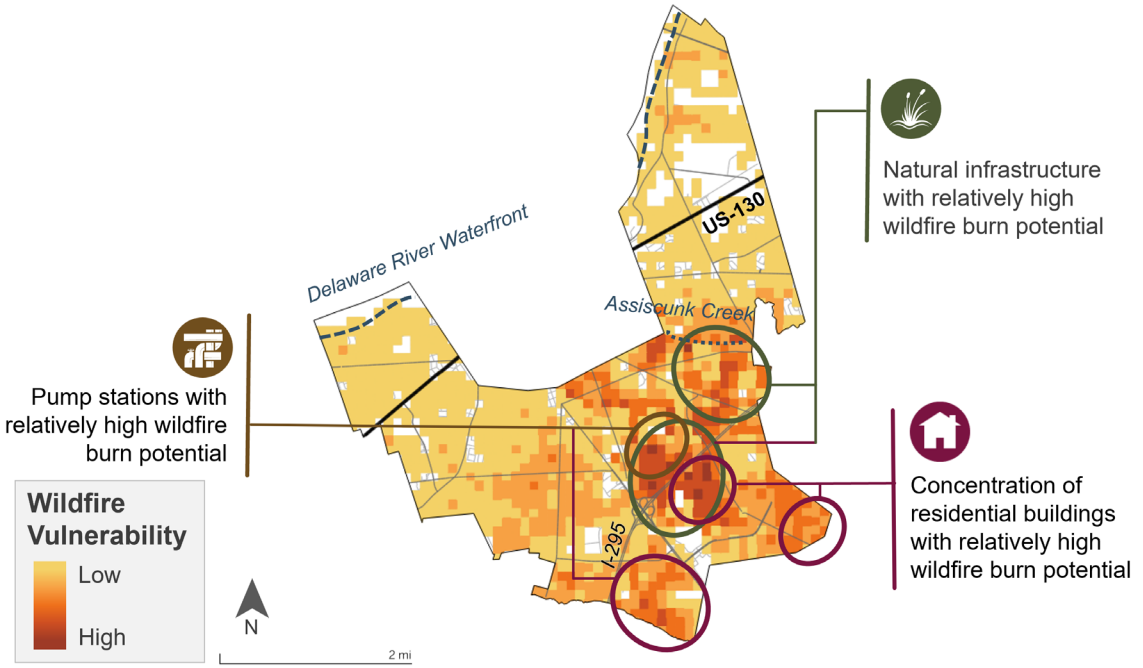
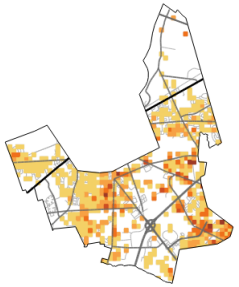


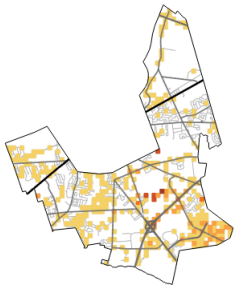
Figure 6.3.10 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.3.11: Wildfire exposure for four themes in Burlington Township.



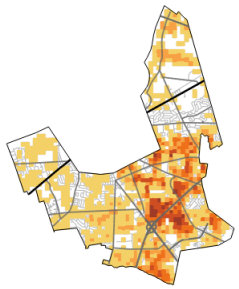
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Burlington Township are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas and forests are most likely to face risk of wildfire exposure, such as in the southeast corner and along State Route 635. Areas with higher density urban development, meanwhile, have lower exposure. Around 4% of buildings and 10% of agricultural lands in the Township have an annual likelihood of burning of at least 0.05%. Agricultural land is also most exposed when adjacent to naturalized areas, such as found in the southeast.



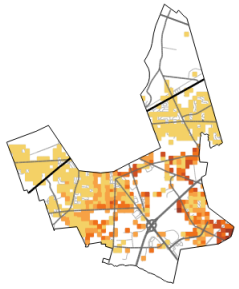
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets impacted in the event of a wildfire include Speedy Gas Service Station, multiple pumping stations, and multiple wells. Roadways in more wildfire-prone areas include the New Jersey Turnpike Extension and I-295. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrubland in the center of the Township, especially near I-295, and wetlands in the south have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Burlington Township communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires in surrounding areas can still cause harm to Burlington Township residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the south, especially along tree-lined I-295, have high concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.3.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.3.6: Distribution of heat exposure scores for land area and assets in Burlington Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	8,622 Acres	4,645 (54%)	697 (8%)	504 (6%)	1,137 (13%)	1,325 (15%)	313 (4%)
Community Resources							
Residential Buildings	6,029 Assets	4,787 (79%)	470 (8%)	280 (5%)	275 (5%)	169 (3%)	48 (1%)
Public & Commercial Buildings	578 Assets	474 (82%)	27 (5%)	17 (3%)	29 (5%)	26 (4%)	5 (1%)
Agricultural Land	528 Acres	371 (70%)	48 (9%)	2 (<1%)	55 (10%)	44 (8%)	8 (2%)
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	60 Assets	51 (85%)	2 (3%)	1 (2%)	1 (2%)	3 (5%)	2 (3%)
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--
Hazardous Material Sites	27 Assets	24 (89%)	2 (7%)	--	--	1 (4%)	--
Transportation Routes	140 Miles	112 (81%)	10 (7%)	4 (3%)	6 (4%)	5 (4%)	2 (2%)
Evacuation Routes	13 Miles	11 (80%)	2 (11%)	--	0.6 (5%)	0.3 (2%)	0.2 (1%)
Natural Infrastructure							
Forests & Shrubland	1,551 Acres	190 (12%)	197 (13%)	192 (12%)	406 (26%)	475 (31%)	93 (6%)
Wildlife Habitat Areas	2,365 Acres	790 (33%)	34 (1%)	124 (5%)	257 (11%)	910 (395)	249 (11%)
Wetlands	1,042 Acres	36 (3%)	40 (4%)	45 (4%)	298 (29%)	477 (46%)	145 (14%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Burlington Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Burlington Township ranges from slightly drought-vulnerable to drought-vulnerable land. Nearly half of the land area in the Township (40%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Burlington Township are spread throughout, with a slight concentration in the central portion of the Township.

Figure 6.3.12 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.3.12: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Burlington Township.

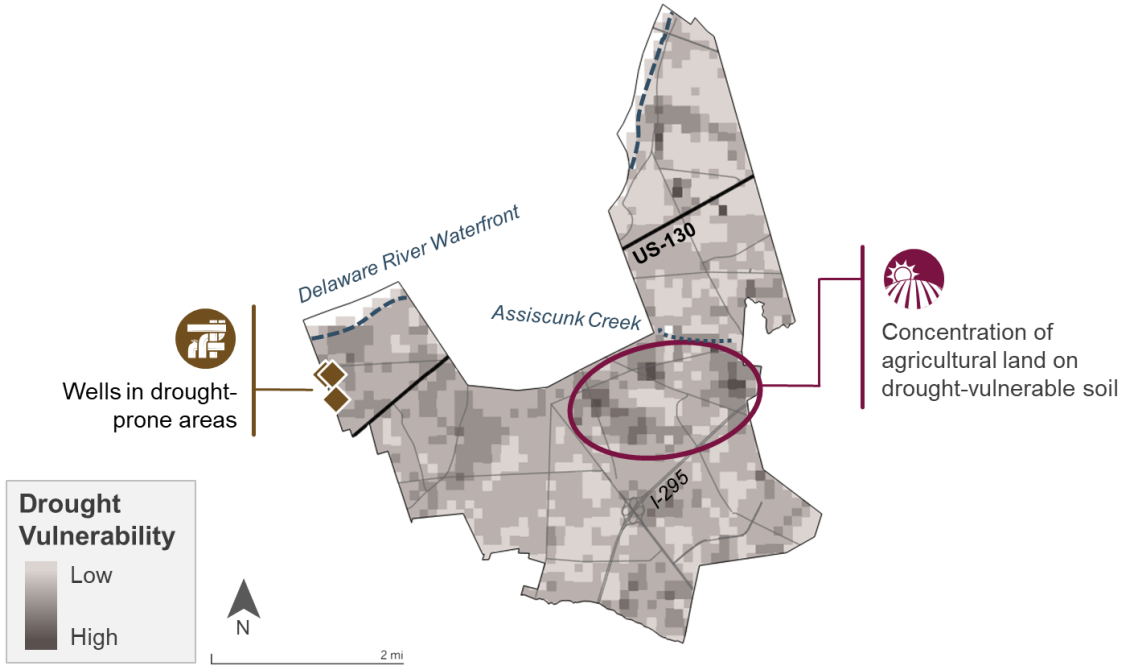
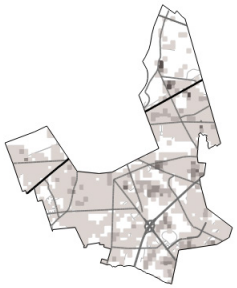
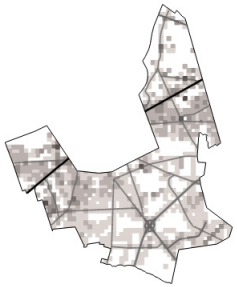


FIGURE 6.3.13: Drought exposure for four themes in Burlington Township



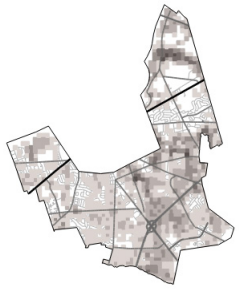
COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. Across the Township, 11% of agricultural land is on highly drought-vulnerable soil, concentrated in the northeast and northwest. Nearly half of the buildings (43%) are also on land modeled to be drought-vulnerable, also concentrated in the northeast and northwest. However, these buildings are considered less sensitive, as they are unlikely to experience direct physical damage or harm due to drought.



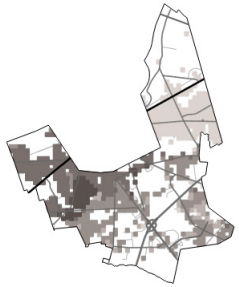
CRITICAL INFRASTRUCTURE

Nearly half of critical infrastructure assets in the Township are on drought-sensitive soil. Between 33% and 70% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, concentrated in the northwest and northeast. Most notably, 67% of the wells in the Township, concentrated in the northwest, are on drought-vulnerable soil and may be impacted due to extreme drought conditions. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Burlington Township, 8% of wetlands and 31% of forests and shrublands are modeled to have drought-vulnerable soil, concentrated in the northwest and northeast.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the northeast have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.3.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.3.7: Distribution of drought exposure scores for land area and assets in Burlington Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	8,622 Acres	12 (<1%)	443 (5%)	3,403 (39%)	1,299 (15%)	3,465 (40%)
Community Resources						
Residential Buildings	6,029 Assets	--	277 (5%)	1,788 (30%)	1,356 (22%)	2,608 (43%)
Public & Commercial Buildings	578 Assets	1 (<1%)	23 (4%)	248 (43%)	60 (10%)	246 (43%)
Agricultural Land	528 Acres	0.1 (<1%)	8 (2%)	401 (76%)	60 (11%)	59 (11%)
Critical Infrastructure						
Utility Infrastructure	60 Assets	--	2 (3%)	30 (50%)	6 (10%)	22 (37%)
Health & Emergency Services	6 Assets	--	--	2 (33%)	2 (33%)	2 (33%)
Hazardous Material Sites	27 Assets	--	4 (15%)	3 (11%)	1 (4%)	19 (70%)
Transportation Routes	140 Miles	0.3 (<1%)	6 (5%)	53 (39%)	19 (14%)	58 (42%)
Evacuation Routes	13 Miles	0.2 (1%)	0.2 (1%)	3.6 (28%)	0.3 (2%)	8.9 (68%)
Natural Infrastructure						
Forests & Shrubland	1,551 Acres	4 (<1%)	92 (6%)	669 (43%)	313 (20%)	474 (31%)
Wildlife Habitat Areas	2,365 Acres	28 (1%)	335 (14%)	1,195 (51%)	477 (205)	330 (14%)
Wetlands	1,042 Acres	5 (<1%)	213 (20%)	514 (49%)	232 (22%)	79 (8%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Burlington Township's efforts to address climate resilience and flood mitigation are deeply rooted in preserving natural features and guiding development away from vulnerable areas. Climate change concerns have also been addressed in State, county and regional initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The importance of wetlands and floodplain protection was first emphasized in the 2005 Master Plan, which recommends clustered development to preserve open space and restrict disturbance in sensitive zones, such as open spaces, wetlands, and floodplains. These strategies support both ecological health and long-term flood resilience.
- Stormwater management became a formal focus in the 2006 Stormwater Management Plan, prepared to comply with updated NJDEP rules. While this plan closely followed State guidelines, it lays the foundation for how the Township handles runoff and water quality, particularly in new developments. The Stormwater Management Plan was re-examined in 2018 as part of the Township's Master Plan Reexamination process.
- The Township's 2018 Master Plan Reexamination Report builds on earlier planning goals by reinforcing the Township's focus on environmental protection and sustainable development in ways that support climate resilience. The reexamination highlights the importance of protecting wetlands, floodplains, stream corridors, and other sensitive natural areas, while promoting smart growth strategies to direct development to appropriate locations. The reexamination report also solidifies the Township's support for clean energy, particularly on-site solar generation, and encourages energy conservation and recycling as part of its development review process. Improvements to bicycle and pedestrian infrastructure are supported not just for recreation, but as a practical transportation option.
- On June 21, 2017, FEMA notified the Mayor that it had completed a re-evaluation of flood hazards in Burlington Township and that modifications to Chapter 282 of the Township Code "Flood Damage Prevention" were necessary to enable continued participation in the National Flood Insurance Program. The proposed amendments to Chapters 282 and 330 further the public health, safety, and welfare. Chapter 330, Sections 34 and 91 were also amended for consistency with the amendments to Chapter 282. It was ordained and enacted by the Township Council of the Township of Burlington that Chapters 282 and 330 of the Township Code were amended to bring the Township's Flood Control Ordinance into compliance.

- In response to updated FEMA guidance, the Township adopted a revised Flood Damage Prevention Ordinance in 2024. This ordinance ensures continued eligibility in the National Flood Insurance Program and reinforces the Township's commitment to protecting life and property in flood-prone areas.
- Burlington Township regularly consults FEMA data, including the Severe Repetitive Loss Properties List, to aid in planning efforts. At the present time, there are no SRL properties located in the Township.

COUNTY EFFORTS

- According to the 2024 Burlington County HMP, Burlington Township has a high hazard rating for severe weather; medium ratings for dam failure, disease outbreak, extreme temperatures, and severe winter weather; and low ratings in drought, earthquake, flood, and wildfire. Flooding is considered a low risk. The Township demonstrates a strong adaptive capacity in dealing with disease outbreak, extreme temperatures, and severe winter weather, and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's CVI, developed in 2014, is an environmental constraint model intended to highlight land areas that are most vulnerable to coastal hazards. The CVI shows that Burlington Township's higher-risk areas are located adjacent to the Delaware River in the western portion of the Township and along Bustleton Creek to the north, and Assiscunk Creek in the central portion of the Township. Moderate-risk areas act as buffers around the higher-risk areas and are present around some of the smaller streams and waterways in the central and southern portions of the municipality. The Township law enforcement station is located within a moderate-risk area.

REGIONAL EFFORTS

- DVRPC's 2017 CVA identifies Burlington Township public infrastructure at risk of coastal flooding—such as the wastewater treatment plant and public works garage—and recommends protective actions like elevating equipment and improving access during emergencies. It also identifies sites where flooding could lead to hazardous material spills and calls for coordination with the NJDEP to reduce this risk. The CVA calls for coordination with Burlington City, evacuation route planning with bridge flooding in mind, as well as the protection of flood-prone open spaces and natural habitats, specifically areas along the Delaware River and identified creeks and waterways. The plan also recommends targeted outreach to develop flood preparedness in existing residential areas prone to flooding and voluntary buy-outs of property that continually floods. The CVA encourages public education in "quiet times," and calls for forward-thinking policy/planning undertakings including incorporating coastal hazards in plans and regulations; undertaking a planning process to plan for storm surge and sea level rise; utilizing a cost-benefit analysis that factors in climate change; including flood mitigation projects into the capital improvements plan or hazard mitigation plan; updating zoning and building codes; participating in FEMA's CRS; adopting a coastal hazard disclosure policy; and more.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. In Burlington Township, there are four residential zoning districts, with minimum lot sizes ranging from 7,500 square feet to 40,000 square feet. The largest of which is the Township's R-12 zone, which has a minimum lot area of 12,000 square feet. There are three commercial zoning districts with minimum lot sizes ranging from 40,000 square feet to 435,600 square feet. There are four industrial zoning districts with minimum lot sizes ranging from 6,500 square feet to 217,000 square feet. **Table 6.3.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and properties with historic deed restrictions, the amount of land potentially available for new development through subdivision can be totaled. Burlington Township contains approximately 7,400 parcels and/or land masses across all zoning districts, which

TABLE 6.3.8: Burlington Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-12 (Medium Density)	12,000 square feet
R-7.5 (High Density)	7,500 square feet
R-20 (Medium Density)	20,000 square feet
R-40 (Low Density)	40,000 square feet
Commercial Zones' Minimum Lot Areas	
B-1 (Regional Business)	435,600 square feet (or 10 acres)
B-2 (Highway Business)	40,000 square feet
B-3 (Neighborhood Business)	40,000 square feet
BLI-1 (Business Light Industrial)	40,000 square feet
BLI-2 (Business Light Industrial)	6,500 square feet
Industrial Zones' Minimum Lot Areas	
I-1 (Industrial – Light)	87,120 square feet (or 2 acres)
I-2 (Industrial – Heavy)	217,800 square feet (or 5 acres)
Miscellaneous or Special Districts Not Considered in Buildout	
I-3 (Industrial – Special)	Not included in inventory
CCRC (Continuing Care Retirement Community)	Not included in inventory

do not face those restrictions above, and about 4,700 acres (or about 205 million square feet) of unconstrained land capable of a complete buildout. These values represent the total unconstrained land base prior to site-specific limitations. They serve as a starting point for understanding where future development may occur, and the following section applies the zones' minimum lot areas to the available land.

The buildout analysis for Burlington Township indicates that the B-2 Highway Business Zone in the southern portion of the municipality has the greatest remaining buildout capacity, as shown in **Table 6.3.9**. The lot size requirements and parcel configuration within this district present a clear opportunity for future growth consistent with the Township's zoning ordinance.

The B-1 and B-3 zones exhibit conditions of exceeded zoning capacity. Although the zoning ordinance requires a minimum lot size of 435,600 square feet and 40,000 square feet, respectively, the buildout analysis indicates land sufficient for nearly 200 conforming lots, whereas over 400 lots exist within the districts today. This suggests that historical development has occurred at a density above what is permitted today, likely resulting in a substantial number of non-conforming parcels.

Note the results of this analysis likely skew towards an overestimation of

TABLE 6.3.9: Burlington Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
B-1	74	8,426,964.58	193.46	435,600	19
B-2	8	3,565,437.70	81.85	40,000	89
B-2	88	6,786,346.69	155.79	40,000	170
B-2	59	3,086,523.38	70.86	40,000	77
B-2	192	3,462,787.04	79.49	40,000	87
B-3	9	70,190.92	1.61	40,000	2
B-3	15	401,241.73	9.21	40,000	10
B-3	42	371,070.38	8.52	40,000	9
B-3	292	5,918,583.04	135.87	40,000	148
BLI-1	4	189,228.29	4.34	40,000	5
BLI-1	73	5,800,436.66	133.16	40,000	145
BLI-1	0	172,545.72	3.96	40,000	4
BLI-2	14	190,842.19	4.38	6,500	29

* *Maximum buildout hypothetical*

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
I-1	54	10,567,672.14	242.60	87,120	121
I-1	24	8,978,259.52	206.11	87,120	103
I-2	98	44,830,475.65	1029.17	217,800	206
I-2	24	7,591,321.39	174.27	217,800	35
R-12	36	534,389.07	12.27	12,000	45
R-12	354	2,851,237.05	65.46	12,000	238
R-12	824	7,205,857.99	165.42	12,000	600
R-12	441	5,625,846.80	129.15	12,000	469
R-12	651	6,187,087.02	142.04	12,000	516
R-12	283	6,393,438.31	146.77	12,000	533
R-12	924	12,442,138.27	285.63	12,000	1,037
R-20	12	226,350.00	5.20	20,000	11
R-20	332	3,537,611.00	81.21	20,000	177
R-20	138	6,406,717.74	147.08	20,000	320
R-20	579	6,177,394.18	141.81	20,000	309
R-40	19	781,366.02	17.94	40,000	20
R-40	277	11,159,849.24	256.19	40,000	279
R-40	41	3,287,577.03	75.47	40,000	82
R-40	1	18,058.28	0.41	40,000	0
R-40	42	1,351,476.54	31.03	40,000	34
R-40	1	312,679.36	7.18	40,000	8
R-7.5	171	754,678.68	17.33	7,500	101
R-7.5	49	430,251.80	9.88	7,500	57
R-7.5	81	695,870.76	15.97	7,500	93
R-7.5	283	2,116,046.77	48.58	7,500	282
R-7.5	487	5,422,967.74	124.49	7,500	723
R-7.5	300	2,954,568.36	67.83	7,500	394

redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings, and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Township has several redevelopment area, including:

- The Crossings (MRP/Clarion Partners) is located along County Rd 541 between 295 and Bromley Blvd. This is designated for a combination of industrial & commercial/retail development. Some development has already occurred but there are several lots to be developed.
- The Haines Industrial Center is located in the northeast quadrant of the site. This was adopted in 2013 and is strictly for industrial development. One undeveloped lot remains and is subject to a preliminary site plan application in November 2025.
- Haines Industrial Center (Block 153, Lots 1.01, 1.03, 1.05: Block 154, Lot 12.05, Block 154.01, Lot 1)
- Aqua Lane/Riverwalk Dev. (Blocks 98.20, 98.21, 98.22, 98.23 & 98.24, inclusive)
- DCT (Block 147, Lots 1.04 & 1.05)
- Cramp Family Trust (Block 105.01, Lots 6.01 & 6.02)
- Clarion Partners (Block 125, Lots 1, 2, 3, 3.02, 4, 4.01, 4.02, 5, 6 & 7; Block 130, Lot 2; Block 132.02, Lots 3, 3.01, 6 & 8.01)
- Liberty Property Trust (Block 152, Lots 1, 1.01, 1.02 & 1.03)
- Terri Lane (Block 120.02, Lots 4, 5 & 6)
- Ferber/JAG Bromley Boulevard Residential Tract (Block 124, Lots 4.01, 9, 10 & 12)

ROUND IV OF AFFORDABLE HOUSING

The DCA determined that the estimated Round 4 Prospective Need for Burlington Township was 308 units of affordable housing. Through Resolution 2025-R-022, the Township challenged DCA's number, and through subsequent mediation with the Courts, the Round IV Obligation was reduced to 235. The Present Need is 132 units, and the Township will address this obligation through the continuation of a Township-run rehabilitation program and participation in the Burlington County Homeowner Housing Rehabilitation Program.

The Township prepared a HEFSP outlining

several mechanisms to address their Prospective Need Round IV Obligation, including utilizing surplus credits from Prior Rounds, extension of existing affordability controls for 21 units, an 80-unit 100% affordable development on Sunset Rd (Block 105 Lot 5), and 7 existing supportive and special needs housing. The HEFSP was adopted by the Planning Board on June 12, 2025, through Resolution 2025-06, and endorsed by the Governing Body on June 24, 2025, through Resolution 2025-R-143. The Sunset Rd site is vacant and wooded. This site was determined to be suitable, approvable, available, and developable in the HEFSP. There are no flood hazard areas present; however, the site contains wetlands in the southeastern portion, located approximately 250 feet away from Sunset Rd. A conceptual site plan was not provided in the HEFSP. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Resilience Strategy

Burlington Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Burlington Township.

> Burlington Township is committed to planning for a sustainable future that protects its natural environment, supports community well-being, and reflects its diverse and forward-looking character. As a vibrant suburban community with strong regional connections and an engaged population, Burlington Township will endeavor to integrate climate resilience into land use, infrastructure, and redevelopment efforts to the maximum extent practicable. The Township will, where appropriate, preserve its open spaces and natural resources, invest in modern and efficient infrastructure, and promote smart, resilient growth to ensure a safe and thriving community for current and future generations.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

BURLINGTON TOWNSHIP RESILIENCE ACTIONS

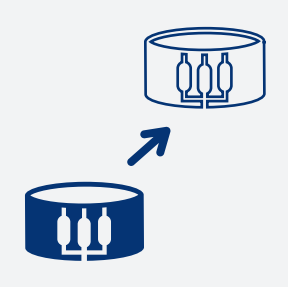
- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.3.14: Purple loosestrife flowers in a field along Irick Rd (CR 637) in Burlington Township. *(Source: Famartin, Wikimedia Commons, CC-BY-SA 4.0)*





BURLINGTON TOWNSHIP RESILIENCE ACTION

Relocation of Public Works Facilities Outside of Designated Flood Hazard Areas

Coordinate with municipal officials to relocate the public works department facilities, currently located in a flood-prone area adjacent to the river, to another area less prone to flooding. This includes potential land acquisition to build a new facility.

RESPONSIBLE PARTY Burlington Township

ESTIMATED COSTS $500K - $5M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

★★★★★

High

BURLINGTON TOWNSHIP RESILIENCE ACTION

Backup Power for Critical Infrastructure

Conduct a comprehensive review of the Township's critical infrastructure to identify facilities essential for emergency operations (e.g., municipal building, police, fire, EMS, water/sewer facilities, shelters). Evaluate existing backup power capabilities and install or upgrade generators and fuel storage where needed to ensure operational continuity during outages.

RESPONSIBLE PARTY Burlington Township

ESTIMATED COSTS $100K - $500K (costs vary by project type)

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, FEMA, New Jersey Office of Emergency Management (NJ OEM)



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

★★★★★

High

BURLINGTON TOWNSHIP RESILIENCE ACTION

Assistance for Residents on Flooding Streets

Prioritize education and outreach for flood preparedness and risk mitigation to the residents living along streets known to have recurrent flooding issues. Streets include New Jersey Ave, Central Ave, Devlin Ave, River Rd, LaClede Dr, Laurie Way, and Neck Rd. Residents on these streets should have well-developed emergency plans so that they can mitigate flood risks and evacuate the area as necessary.

RESPONSIBLE PARTY	Burlington Township
ESTIMATED COSTS	$0 - $250K (costs could be incorporated into ongoing outreach)
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-2 years*

PRIORITY RATING

★★★★☆

Medium-High

**complete as part of the Township's MS4 permit*

BURLINGTON TOWNSHIP RESILIENCE ACTION

Mitigation of Central Ave Sewage Treatment Plant

Coordinate with the chief operator at the Central Ave Sewage Treatment Plant to support the mitigation of the plant via retrofit (e.g., elevation, flood-proofing). This would entail identifying the most cost-effective mitigation options and then working with the operator to implement selected action(s) based on available funding and local match ability. As part of this process, the Township should ensure that the height to which it is currently elevating vulnerable mechanical equipment at the plant will keep the equipment safe in future flooding scenarios. Also, flooding on Devlin Ave and Central Ave may block access to and from the wastewater treatment plant, which could slow the Township's recovery process. The Township sewer department should work with the Township OEM to develop a protocol for gaining access to the plant during a flood. Future improvements critical to the plant's operation should be elevated above the special flood hazard area.

RESPONSIBLE PARTY	Burlington Township
ESTIMATED COSTS	$500K - $5M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

BURLINGTON TOWNSHIP RESILIENCE ACTION

Preserve Dedicated Open Space

The Township will cooperate with the owners of dedicated open space who wish to conserve/ preserve their property. This could include dedicated open space along the Delaware River, Marters Ditch, Tanners Run, Assiscunk Creek, and Bustleton Creek that have known flood hazard exposure to reduce future risk. This would likely be through statewide programs to preserve natural resources and reduce development in flood-prone areas.

RESPONSIBLE PARTY	Burlington Township, Private Property Owners, NJDEP
ESTIMATED COSTS	Unclear; costs would be covered by the state or other sources
POSSIBLE SOURCE(S) OF FUNDING	Green Acres, Blue Acres, The Nature Conservancy, Trust for Public Land, New Jersey Conservation Foundation



ESTIMATED TIMELINE

5-10 years

PRIORITY RATING

★☆☆☆☆

Low

BURLINGTON TOWNSHIP RESILIENCE ACTION

Encourage the Use of Stormwater Management Best Management Practices (BMPs)

Address flooding at smaller creeks by developing downstream stormwater management BMPs on public land (where land is available) to reduce impacts to private property

RESPONSIBLE PARTY Burlington Township

ESTIMATED COSTS $100K - $1M (costs vary by project type)

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-10 years

PRIORITY RATING

Low



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

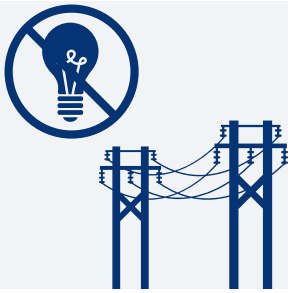


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



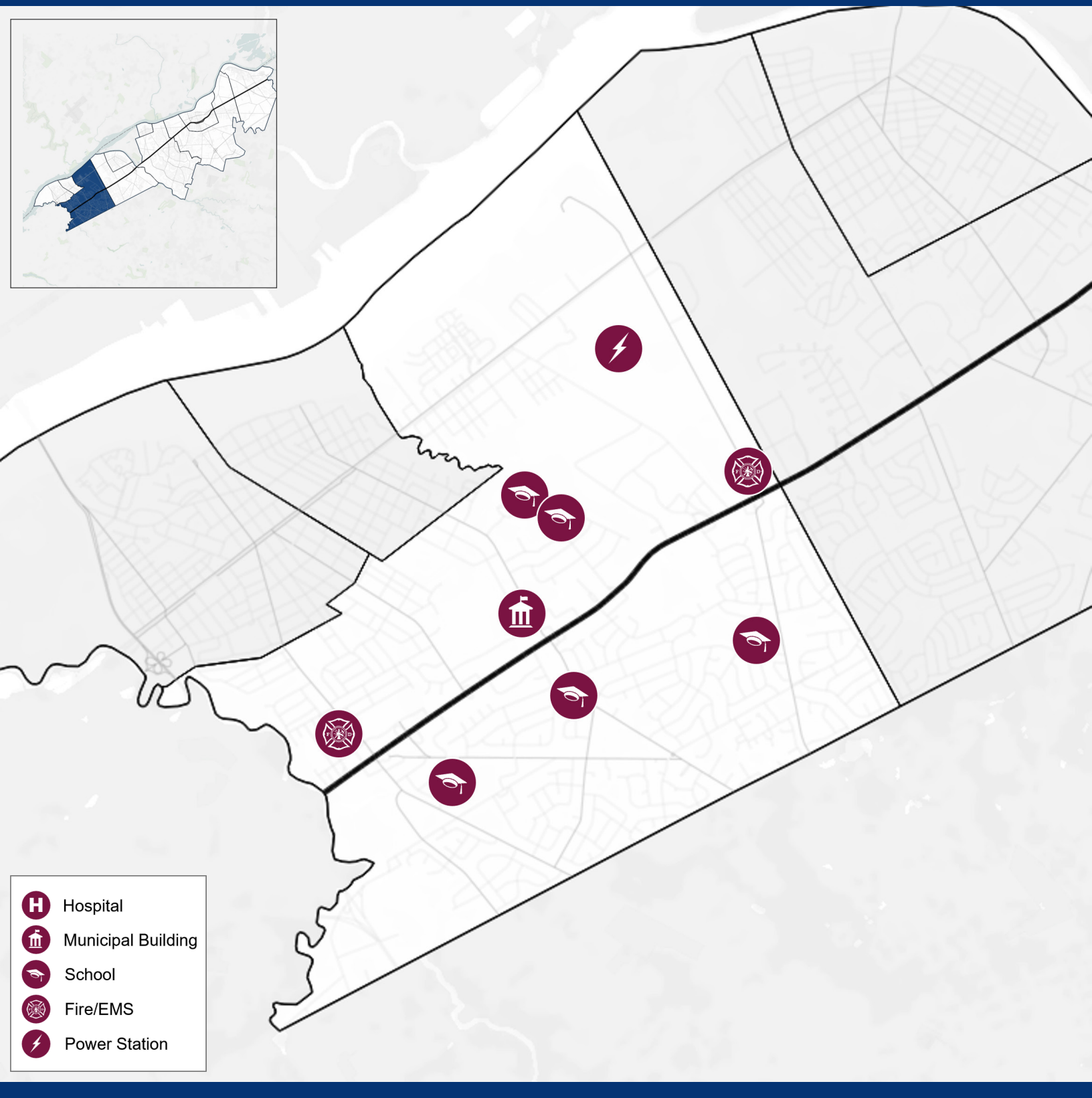
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.4: Cinnaminson Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Cinnaminson Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a moderate area of concern for residents and community leaders in Cinnaminson Township and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Cinnaminson Township can be found in the north along the Delaware River and along the Pennsauken Creek in the west.



Sea Level Rise: Sea level rise is a growing concern for Cinnaminson. The overall extent of sea level rise hazard exposure in the Township is low, with a majority concentrated in the northeast and western edges of the Township, specifically on the shores of the waterways.



Heat: Cinnaminson Township has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Township can be found in the north in the Industrial Zone, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Cinnaminson Township has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Cinnaminson is east and the southwest corner.



Wildfire: Cinnaminson has an overall lower risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Cinnaminson is highest in the eastern part of the Township.



Drought: Cinnaminson Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Cinnaminson Township ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Cinnaminson Township's vulnerability assessment, and include:

- Second Phase Flood Mitigation in Parry
- Public Outreach and Education about Flood Mitigation
- Physical and Programmatic Actions to Reduce Extreme Heat
- Improve Local Drainage Infrastructure
- Stream Debris Management and Maintenance Coordination
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Cinnaminson Township (the Township) is located west of Moorestown and southeast of Riverton Borough and contains a population of 17,243. The northern portion of the Township fronts Delran Township, and the southern end is adjacent to the Pennsauken Creek. The Township's western edges abut Riverton Borough, Palmyra Borough, and the Delaware River. The Route 130 corridor in the Township contains businesses, professional offices, and age-restricted housing. The northern portion of the Township is served by a River LINE light rail station which runs parallel to River St. **Table 6.4.1** shows socially vulnerable populations in Cinnaminson Township. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.4.1: Socially vulnerable populations in Cinnaminson Township.

DEMOGRAPHIC VARIABLE	CINNAMINSON TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	17,243	--	9,267,014	--
Total Household Units	6,284	--	3,775,842	--
Occupied Housing Units	6,149	--	3,478,355	--
Vacant Housing Units	135	--	297,487	--
Population 18 or Younger	3,580	20.80%	2,031,322	21.90%
Population 65 or Older	3,609	**20.93%**	1,559,816	16.83%
Population with a disability	2,001	**11.60%**	975,308	10.60%
Persons without a high school diploma	627	5.13%	600,736	9.30%

DEMOGRAPHIC VARIABLE	CINNAMINSON TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons below poverty level	1,173	6.83%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	**6.60%**	N/A*	6.20%
Persons uninsured	639	3.70%	682,266	7.40%
Persons who speak English "less than well"	269	1.66%	562,865	6.44%
Single Parent households	320	5.20%	198,943	5.72%
Minority Ethnicity (non-white)	3,102	17.99%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	477	7.59%	639,960	16.95%
Crowded housing units	37	0.60%	129,710	3.73%
Households with no vehicle	143	2.30%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Borough of Palmyra, Borough of Riverton, Cinnaminson Township, Delran Township, and Riverside Township took place on April 24th, 2025, from 6:30 to 8:30 p.m. Approximately 35 stakeholders attended the meeting, including the mayors of Delran, Borough of Riverton, and Riverside, and various council members. Five participants were affiliated with Cinnaminson Township. Attendees from Cinnaminson were primarily concerned with issues of flooding, ecological damage, high and rising temperatures, and wastewater storage. Problem areas identified include baseball fields near 2205 Lenola Rd, industrial waste areas, the creek, and several flood-prone roadways. Stakeholders from Cinnaminson indicated that Cinnaminson Harbor, Union Landing Rd, and the community's vast green space were noted as some of the Township's most important assets. Resilience to stakeholders in Cinnaminson means the ability to adapt as a community

to environmental changes, diversification of power sources, and prioritizing green space and other greenhouse gas reduction strategies.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

Two meeting attendees were from Cinnaminson Township. Comments and poll results mentioned flooding as a hazard in the community.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Cinnaminson Township, Palmyra Borough, and Riverton Borough in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Cinnaminson. Flooding in East Riverton was highlighted as a perpetual issue.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed, and the information needed for the development of all actions were discussed. The draft policy statements were also reviewed. Cinnaminson officials highlighted the power of collective action and communities coming together to approach resilience actions. Cinnaminson highlighted the need for the dredging of Pompeston Creek. Another theme remarked upon by the municipality staff is that areas that did not flood in the past have

been recently flooded, such as areas on Edgewood Ln.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them, and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Cinnaminson representatives noted that stormwater discharge is impaired between Highland Ave and Cherry Ln. They also ordered the hazards by importance:

- Flood *(most important)*
- Heat
- Wildfire
- Landslide *(least important)*

Cinnaminson representatives noted that all regional resilience actions mentioned (continuation of road maintenance to respond to climate change impacts, stream clearing, bank stabilization, channel restoration, and coordinated response to widespread power outages) were important and confirmed their interest in these actions for their community. As indicated in their ranking of the hazards, the Township noted that flooding and drainage are key issues for them and was interested in looking into heat mitigation. The Township is looking into building a splash park in the next few years. They noted that stormwater improvements have been made in the East Riverton section on the west side of River Rd, including a flood gate, curbing with new roads, and five stormwater basins. The Township is also making improvements in the Parry section of Cinnaminson. The improvements include repair of failed underground drainage. One potential resilience action discussed is further flood studies and mitigation in areas of known concerns, such as Fork Landing Rd between Lenola Rd and Route 73, and education and awareness around flood mitigation actions a homeowner could take.

Map and Survey Comments

The Project Team received one point of information for Cinnaminson, which noted flooding and poor drainage on Bannard St and Industrial Highway, in front of the Cinnaminson light rail station. Bannard St and Industrial Highway were identified as areas with flooding and poor drainage. It was noted that the problem area is right in front of the Cinnaminson light rail station.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

Flooding

Flooding is a moderate area of concern for residents and community leaders in Cinnaminson Township and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Cinnaminson Township is in the north along the Delaware River and along the Pennsauken Creek in the west. These areas represent 22% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. Around two-thirds of the Township (67%) are not within a modeled floodplain used in this analysis.

Figure 6.4.1 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.4.1: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

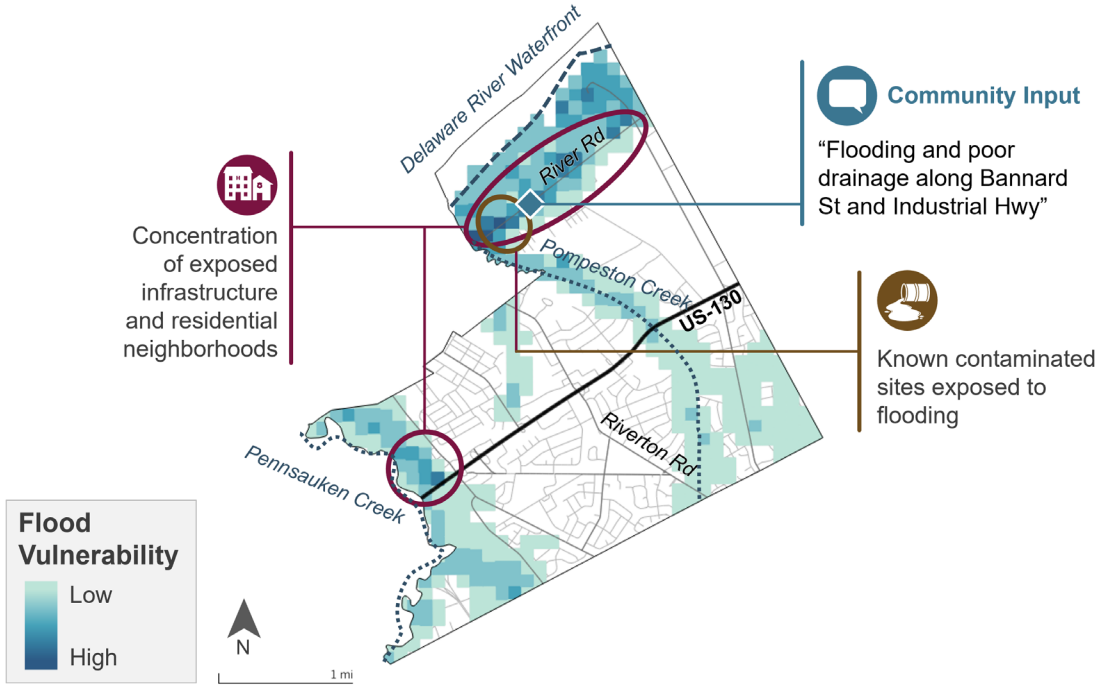


FIGURE 6.4.2: Flood exposure for four themes in Cinnaminson Township.



COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Cinnaminson Township, approximately 7%, or 391 of the 5,781 residential buildings in the Township, are classified as having high flood exposure (within a 1% annual chance floodplain today), and 13%, or 79 of the 624 public and commercial buildings have high exposure, concentrated mostly in the north along the Delaware River and to the west along the Pennsauken Creek. Twenty-seven acres of agricultural land in the Township is also considered to have high flood exposure, the majority of which is located in the north along the Delaware River.

CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Cinnaminson Township, none of the utility infrastructure or health and emergency service facilities have a high exposure to flooding. Hughes Industries and Arthur J Evers Corporation are hazardous material sites with flood exposure, with the potential for releases resulting in public health concerns and environmental damage. Eleven miles of transportation routes in the Township also have high flood exposure, and 0.4 miles of those are evacuation routes. Broad St has the highest mileage exposed among roadways, with 0.7 miles of roadway exposed to a 1% annual chance flood.

NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Cinnaminson Township, 144 acres, or 45%, of forests and shrublands are exposed to high levels of flooding, the majority of which are located in the north along the Delaware River. Similarly, 97% of wildlife habitat areas and 90% of wetlands are also within high flood exposure areas north along the Delaware River and west along Pennsauken Creek. Wetlands are even more resilient to flooding effects than other asset types.

SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the north have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River and Pennsauken Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.4.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.4.2: Distribution of flood exposure scores for land area and assets in Cinnaminson Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	4,726 Acres	3,148 (67%)	342 (7%)	202 (4%)	1,035 (22%)
Community Resources					
Residential Buildings	5,781 Assets	4,635 (80%)	536 (9%)	219 (4%)	391 (7%)
Public & Commercial Buildings	624 Assets	465 (75%)	43 (7%)	37 (6%)	79 (13%)
Agricultural Land	111 Acres	72 (65%)	9 (8%)	3 (3%)	27 (24%)
Preserved Farmland	80 Acres	67 (84%)	3 (4%)	2 (3%)	8 (10%)
Critical Infrastructure					
Utility Infrastructure	39 Assets	38 (97%)	1 (3%)	--	--
Health & Emergency Services	8 Assets	7 (88%)	1 (13%)	--	--
Hazardous Material Sites	23 Assets	17 (74%)	--	2 (9%)	4 (17%)
Transportation Routes	101 Miles	75 (74%)	9 (9%)	7 (7%)	11 (11%)
Evacuation Routes	8 Miles	7 (86%)	0.6 (7%)	0.1 (1%)	0.4 (6%)
Natural Infrastructure					
Forests & Shrubland	316 Acres	134 (42%)	30 (10%)	9 (3%)	144 (45%)
Wildlife Habitat Areas	109 Acres	2 (1%)	0.9 (1%)	0.8 (1%)	105 (97%)
Wetlands	326 Acres	26 (8%)	5 (1%)	2 (1%)	293 (90%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a growing concern for Cinnaminson. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware, Pompeston Creek, and Pensauken Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the northeast and western edges of the Township, specifically on the shores of the waterways. Across the Township, 371 acres, or 8%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is low with a majority in the east and northern borders. Around the end of the century, 15% of the land area in the Township may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.4.3 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.4.3: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

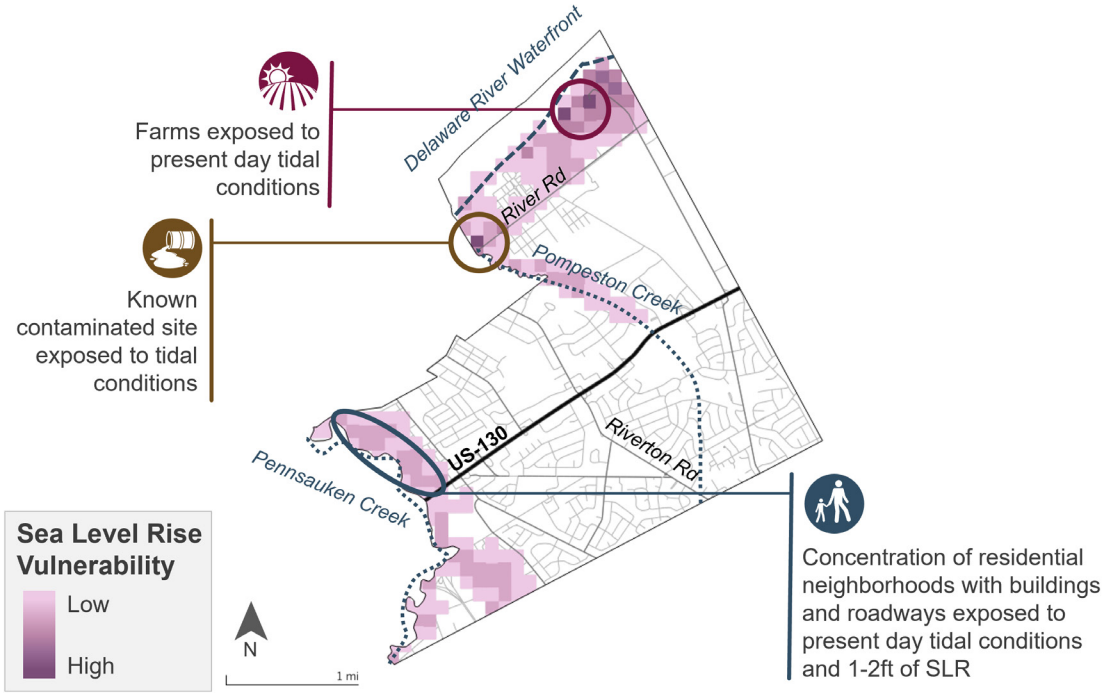


FIGURE 6.4.4: Sea level rise exposure for four themes in Cinnaminson Township.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Cinnaminson, 144 homes and 45 public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and 279 and 62, respectively, would be exposed at five feet. These buildings are concentrated in the northeast and western edges of the Township. Additionally, only 29 acres of agricultural land, with the highest exposure being in the northeast, are exposed to tidal inundation at five feet of sea level rise.

CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Cinnaminson, 4 known contaminated sites and 6.9 miles of roadway are exposed to tidal inundation in the five-foot sea level rise scenario. The known contaminated sites may pose health and environmental safety risks if flooded and are concentrated around Broad Street near Pompeston Creek.

NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels—wetlands are known to migrate inland with rising sea levels if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 267 acres, representing 82% of wetlands in the Township are exposed to 4-5 feet of tidal inundation, localized along the shores of the major waterways. Similarly, 39% of forests and shrublands, and 97% of wildlife habitat areas are exposed under the same conditions.

SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in northeast and western edges that line the shores of the major waterways have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.4.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.4.3: Distribution of sea level rise exposure scores for land area and assets in Cinnaminson Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	4,726 Acres	4,016 (85%)	54 (1%)	71 (1%)	87 (2%)	70 (1%)	58 (1%)	371 (8%)
Community Resources								
Residential Buildings	5,781 Assets	5,502 (95%)	63 (1%)	72 (1%)	88 (2%)	39 (1%)	12 (<1%)	5 (<1%)
Public & Commercial Buildings	624 Assets	562 (90%)	5 (1%)	12 (2%)	12 (2%)	17 (3%)	9 (1%)	7 (1%)
Agricultural Land	111 Acres	90 (81%)	5 (4%)	6 (5%)	0.4 (<1%)	0.1 (<1%)	1 (1%)	9 (8%)
Preserved Farmland	80 Acres	72 (90%)	1 (2%)	0.3 (<1%)	--	--	1 (2%)	4 (6%)
Critical Infrastructure								
Utility Infrastructure	39 Assets	39 (100%)	--	--	--	--	--	--
Health & Emergency Services	8 Assets	8 (100%)	--	--	--	--	--	--
Hazardous Material Sites	23 Assets	19 (83%)	1 (4%)	1 (4%)	--	2 (9%)	--	--
Transportation Routes	101 Miles	94 (93%)	2 (2%)	1 (1%)	1 (1%)	1 (1%)	0.9 (1%)	0.7 (1%)
Evacuation Routes	8 Miles	8 (97%)	--	--	--	--	--	0.3 (3%)
Natural Infrastructure								
Forests & Shrubland	316 Acres	193 (61%)	7 (2%)	16 (5%)	15 (5%)	7 (2%)	12 (4%)	67 (21%)
Wildlife Habitat Areas	109 Acres	3 (3%)	2 (2%)	2 (2%)	1 (1%)	--	2 (1%)	99 (91%)
Wetlands	326 Acres	59 (18%)	2 (1%)	8 (3%)	9 (3%)	11 (3%)	12 (4%)	225 (69%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Cinnaminson Township has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township can be found in the north. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 7% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 8% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.4.5 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.4.5: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

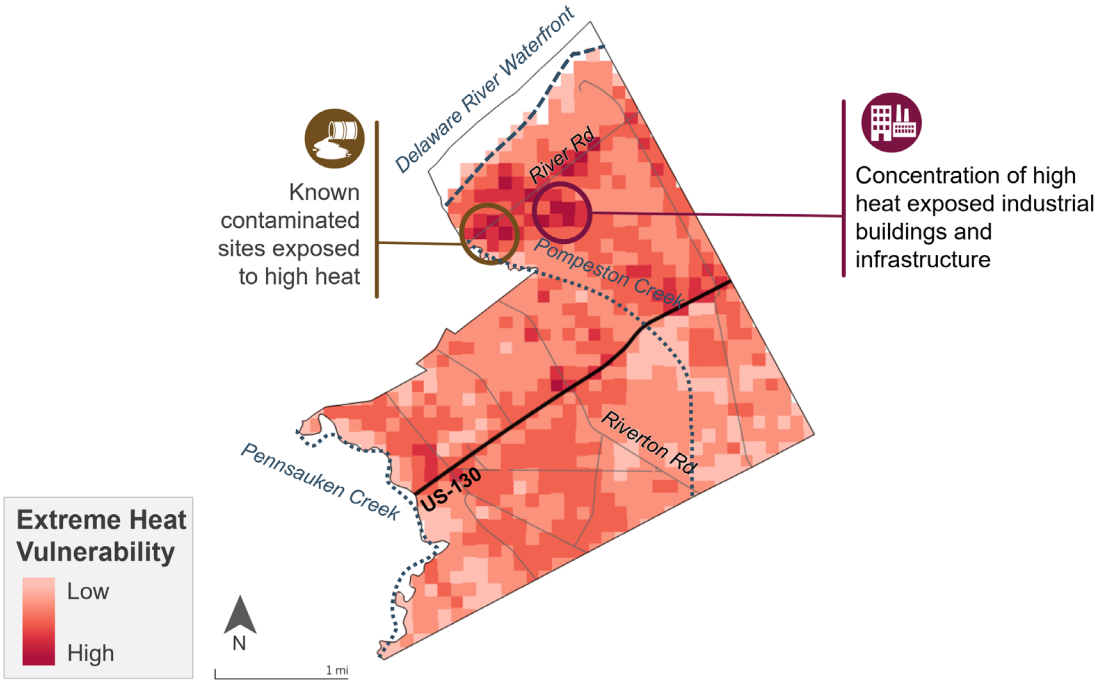
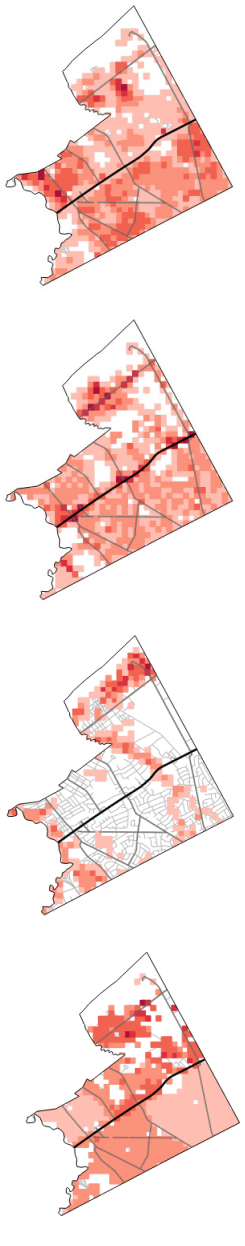


FIGURE 6.4.6: Heat exposure for four themes in Cinnaminson Township.



COMMUNITY RESOURCES

In Cinnaminson Township, 1% of residential buildings and 19% of public and commercial buildings have at least moderate-high heat exposure, concentrated mostly in the north. Twelve public or commercial buildings have particularly high measured heat exposure. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat. While higher temperatures can also impact agricultural lands and reduce crop yields, these areas experience relatively lower temperature extremes than their more urbanized counterparts.

CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 14% of utility infrastructure, 13% of health and emergency services, 44% of hazardous material sites, and 12% of transportation routes in the Township have at least moderate-high heat exposure, with a concentration in the northern portion of the Township. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.

NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Cinnaminson Township, 83% of forests and shrublands, 96% of wetlands, and all wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are mostly in the north of the Township.

SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the northeast of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.4.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.4.4: Distribution of heat exposure scores for land area and assets in Cinnaminson Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	4,726 Acres	389 (8%)	1,649 (35%)	2,362 (50%)	292 (6%)	34 (1%)
Community Resources						
Residential Buildings	5,781 Assets	28 (<1%)	2,147 (37%)	3,557 (62%)	48 (1%)	1 (<1%)
Public & Commercial Buildings	624 Assets	14 (2%)	134 (21%)	361 (58%)	103 (17%)	12 (2%)
Agricultural Land	111 Acres	14 (12%)	42 (38%)	48 (43%)	8 (7%)	--
Preserved Farmland	80 Acres	10 (13%)	30 (37%)	35 (44%)	5 (6%)	--
Critical Infrastructure						
Utility Infrastructure	39 Assets	--	4 (10%)	29 (74%)	5 (13%)	1 (3%)
Health & Emergency Services	8 Assets	--	3 (38%)	4 (50%)	1 (13%)	--
Hazardous Material Sites	23 Assets	1 (4%)	5 (22%)	7 (30%)	8 (35%)	2 (9%)
Transportation Routes	101 Miles	0.6 (1%)	23 (23%)	66 (65%)	11 (11%)	0.7 (1%)
Evacuation Routes	8 Miles	0 (<1%)	0.9 (12%)	4 (47%)	3 (41%)	--
Natural Infrastructure						
Forests & Shrubland	316 Acres	103 (33%)	158 (50%)	54 (17%)	--	--
Wildlife Habitat Areas	109 Acres	105 (97%)	4 (3%)	--	--	--
Wetlands	326 Acres	204 (63%)	108 (33%)	13 (4%)	0.8 (<1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Cinnaminson Township has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Cinnaminson is east and the southwest corner. Overall, 19% of the land area in the Township is considered exposed to landslides.

Figure 6.4.7 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.4.7: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

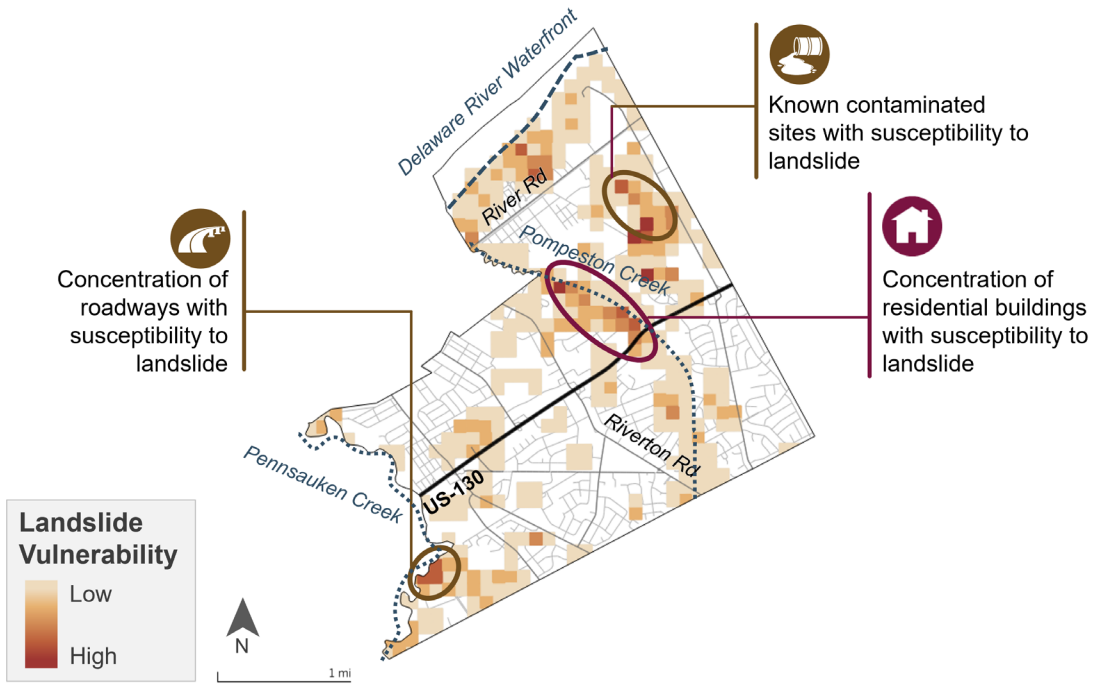
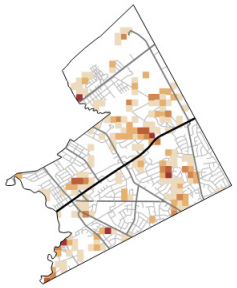


FIGURE 6.4.8: Landslide exposure for four themes in Cinnaminson Township.



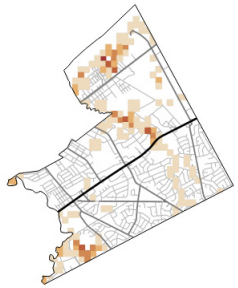
COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 9% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.3% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the east along Pompeston Creek and other waterbodies.



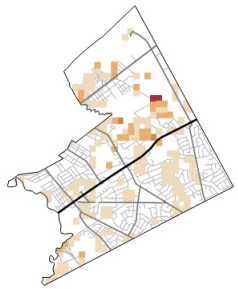
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township are not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include multiple land mobile private towers, multiple microwave towers, Sam's Pharmacy, and the Cinnaminson Department of Public Works Gas Station. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are Besty Ross Bridge, US 130, and South Fork Ln.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 236 acres, or 37%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 8% of forests and shrublands, and 2% of wetlands have between moderate and high exposure. Similarly, 30 acres, or 28%, of wildlife habitat areas also have known landslide exposure. These areas are centralized in the northeast and southwest.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the north have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include those in the northeast.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.4.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.4.5: Distribution of landslide exposure scores for land area and assets in Cinnaminson Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	4,726 Acres	3,839 (81%)	513 (11%)	261 (6%)	96 (2%)	8 (<1%)	9 (<1%)
Community Resources							
Residential Buildings	5,781 Assets	5,287 (91%)	377 (7%)	109 (2%)	8 (<1%)	--	--
Public & Commercial Buildings	624 Assets	514 (82%)	76 (12%)	20 (3%)	13 (2%)	--	1 (<1%)
Agricultural Land	111 Acres	100 (90%)	7 (6%)	4 (4%)	--	--	--
Preserved Farmland	80 Acres	76 (96%)	--	3 (4%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	39 Assets	28 (72%)	2 (5%)	--	9 (23%)	--	--
Health & Emergency Services	8 Assets	8 (100%)	--	--	--	--	--
Hazardous Material Sites	23 Assets	17 (74%)	2 (9%)	--	4 (17%)	--	--
Transportation Routes	101 Miles	85 (84%)	12 (12%)	3 (3%)	0.8 (1%)	--	--
Evacuation Routes	8 Miles	5 (7%)	1 (1%)	1 (1%)	0.4 (5%)	--	--
Natural Infrastructure							
Forests & Shrubland	316 Acres	187 (59%)	63 (20%)	41 (13%)	25 (8%)	--	--
Wildlife Habitat Areas	109 Acres	79 (73%)	24 (22%)	6 (5%)	--	--	--
Wetlands	326 Acres	220 (67%)	61 (19%)	38 (12%)	8 (2%)	0.1 (<1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Cinnaminson has an overall lower risk due to wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Cinnaminson is not particularly high, wildfires are more likely in surrounding areas, such as the southeastern parts of Burlington County. Even if infrastructure in Cinnaminson is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Areas of relatively higher wildfire potential exist in pockets across Cinnaminson, especially in areas with undeveloped land (such as the township's over 600 acres of forests and wetlands) as well as developed neighborhoods with high vegetation and proximity to open space. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Less than 1% of land area in the Township has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

Figure 6.4.9 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.4.9: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

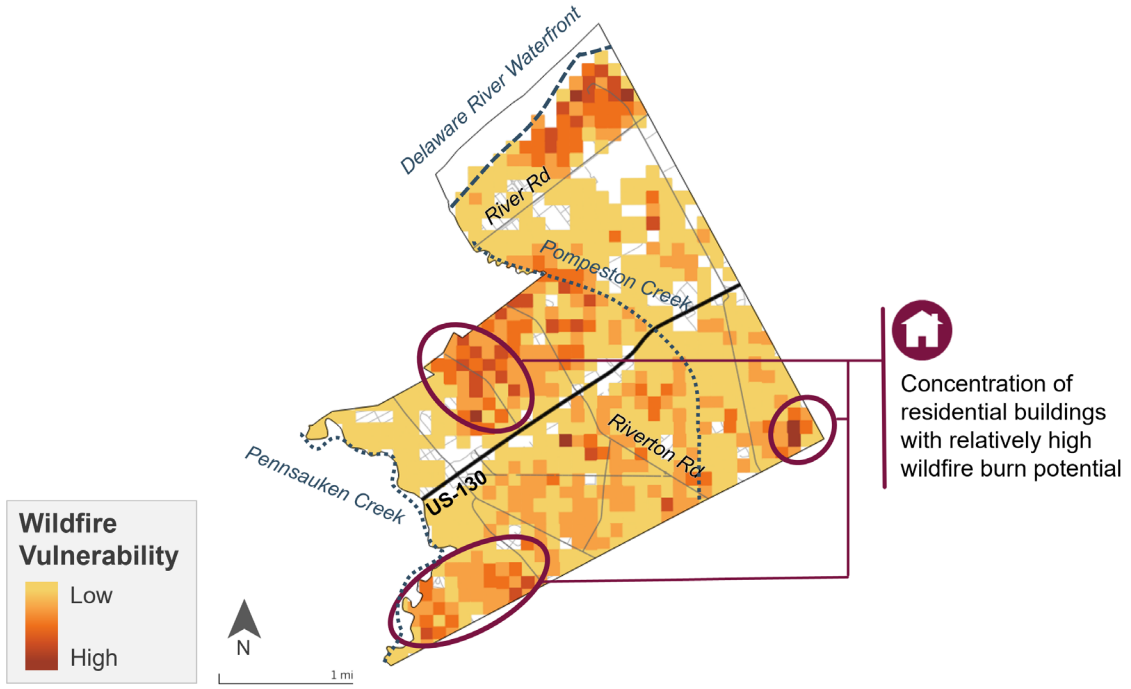
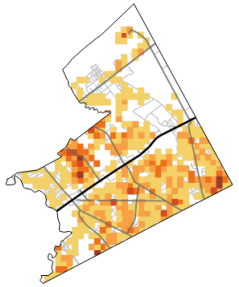
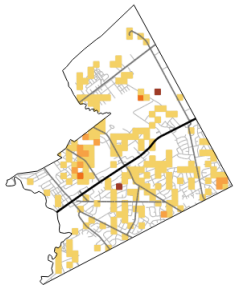


FIGURE 6.4.10: Wildfire exposure for four themes in Cinnaminson Township.



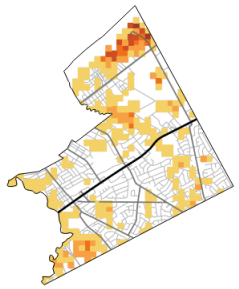
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Cinnaminson are outside of areas considered exposed to wildfire. Buildings close to undeveloped open spaces are most exposed, such as in the easternmost corner of the Township and surrounding the Riverton Country Club. Areas with higher density urban development, meanwhile, have lower exposure. Less than 1% of buildings and none of the agricultural lands have an annual likelihood of burning of at least 0.05%. Agricultural land is also most exposed when adjacent to naturalized areas, such as those found in the northeast near the Taylor Wildlife Preserve.



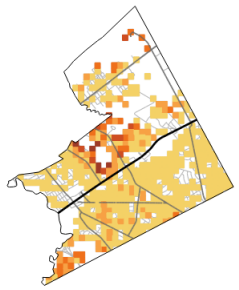
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas include multiple Land Mobile Private Towers, one electric substation, and two hazardous material sites. Roadways in more wildfire-prone areas are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands in the northeast and wetlands in the southwest along the Pennsauken Creek have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Cinnaminson communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Cinnaminson in surrounding areas can still cause harm to Cinnaminson residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Areas of the Township above US Highway 130 have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.4.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.4.6: Distribution of heat exposure scores for land area and assets in Cinnaminson Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	4,726 Acres	3,115 (66%)	278 (6%)	948 (20%)	380 (8%)	5 (<1%)	--
Community Resources							
Residential Buildings	5,781 Assets	4,494 (78%)	161 (3%)	796 (14%)	315 (5%)	15 (<1%)	--
Public & Commercial Buildings	624 Assets	562 (90%)	14 (2%)	38 (6%)	10 (2%)	--	--
Agricultural Land	111 Acres	59 (53%)	10 (9%)	31 (28%)	11 (10%)	--	--
Preserved Farmland	80 Acres	49 (62%)	9 (11%)	21 (26%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	39 Assets	36 (92%)	--	3 (8%)	--	--	--
Health & Emergency Services	8 Assets	8 (100%)	--	--	--	--	--
Hazardous Material Sites	23 Assets	21 (91%)	--	2 (9%)	--	--	--
Transportation Routes	101 Miles	90 (89%)	2 (2%)	6 (6%)	4 (4%)	0.1 (<1%)	--
Evacuation Routes	8 Miles	8 (98%)	0.1 (1%)	--	0.1 (1%)	--	--
Natural Infrastructure							
Forests & Shrubland	316 Acres	48 (15%)	53 (17%)	188 (59%)	28 (9%)	--	--
Wildlife Habitat Areas	109 Acres	25 (23%)	--	84 (77%)	--	--	--
Wetlands	326 Acres	39 (12%)	75 (23%)	141 (43%)	70 (21%)	0.4 (<1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Cinnaminson Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Cinnaminson Township ranges from slightly drought-vulnerable to drought-vulnerable land. A little over a third of the land area in the Township (39%) is drought-vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in the Township are concentrated mostly in the northern corner.

Figure 6.4.11 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.4.11: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Cinnaminson Township.

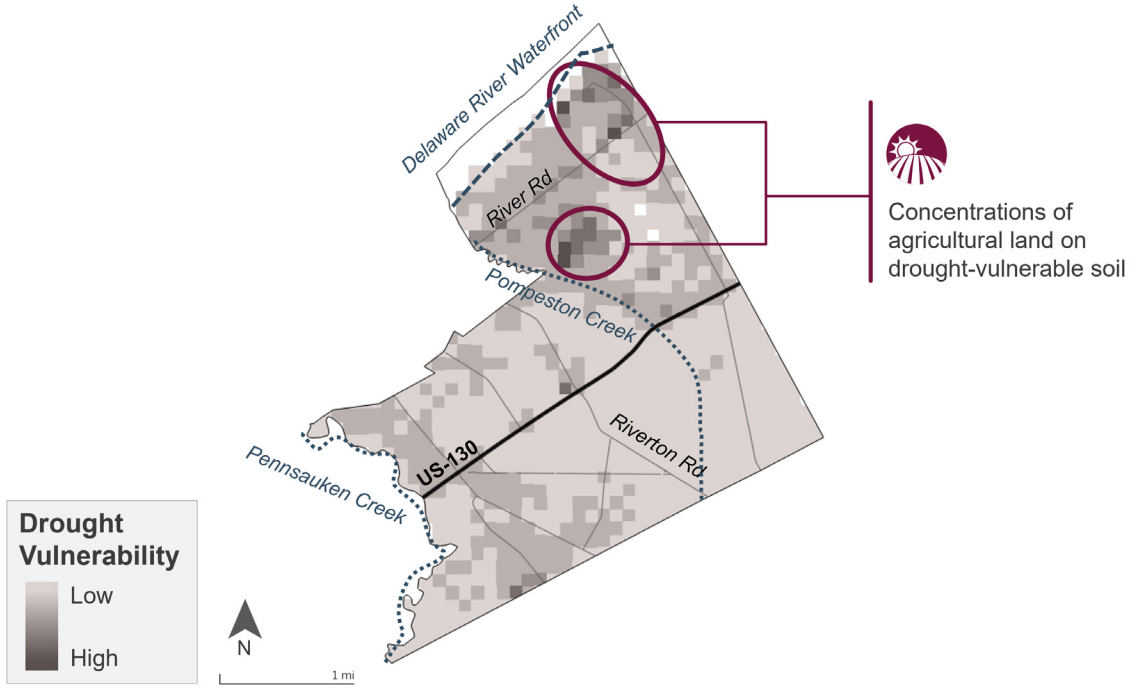
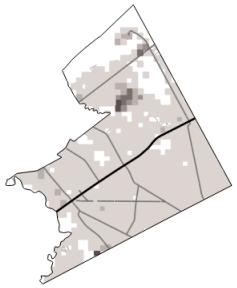
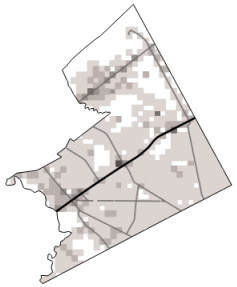


FIGURE 6.4.12: Drought exposure for four themes in Cinnaminson Township



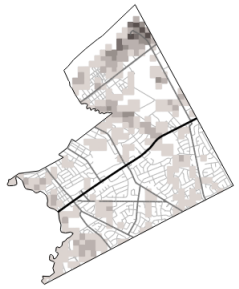
COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. About 62% of agricultural land in the Township is on drought-vulnerable soil, mostly concentrated in the northern corner. Approximately a third of buildings (32%) are also on land modeled to be drought-vulnerable, spread throughout, although not in the central area of the Township. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



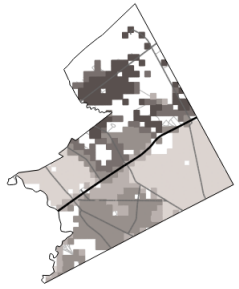
CRITICAL INFRASTRUCTURE

Nearly a third of critical infrastructure assets in the Township are on drought-sensitive soil. Between 10% and 83% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, the majority of which are in the northern area of the Township. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Cinnaminson Township, 46% of wetlands and 39% of forests and shrublands are modeled to have drought-vulnerable soil, concentrated mostly in the northern corner.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the northern corner have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.4.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.4.7: Distribution of drought exposure scores for land area and assets in Cinnaminson Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	4,726 Acres	48 (1%)	251 (5%)	1,095 (23%)	1,505 (32%)	1,828 (39%)
Community Resources						
Residential Buildings	5,781 Assets	47 (1%)	597 (10%)	1,929 (33%)	1,410 (24%)	1,798 (31%)
Public & Commercial Buildings	624 Assets	14 (2%)	20 (3%)	121 (19%)	191 (31%)	278 (45%)
Agricultural Land	111 Acres	--	--	--	42 (38%)	69 (62%)
Preserved Farmland	80 Acres	--	0.1 (<1%)	--	36 (45%)	44 (55%)
Critical Infrastructure						
Utility Infrastructure	39 Assets	--	--	12 (31%)	23 (59%)	4 (10%)
Health & Emergency Services	8 Assets	--	--	4 (50%)	3 (38%)	1 (13%)
Hazardous Material Sites	23 Assets	3 (13%)	--	--	1 (4%)	19 (83%)
Transportation Routes	101 Miles	0.6 (<1%)	7 (7%)	28 (28%)	30 (30%)	34 (34%)
Evacuation Routes	8 Miles	0.1 (1%)	0.3 (4%)	2.1 (26%)	3.7 (47%)	1.7 (22%)
Natural Infrastructure						
Forests & Shrubland	316 Acres	0.4 (<1%)	8 (3%)	35 (11%)	150 (48%)	122 (39%)
Wildlife Habitat Areas	109 Acres	4 (4%)	9 (8%)	3 (3%)	17 (15%)	76 (70%)
Wetlands	326 Acres	0.7 (<1%)	94 (29%)	13 (4%)	70 (22%)	148 (46%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Cinnaminson Township's planning documents reflect a longstanding emphasis on environmental protection and open space preservation, though speak less on climate change or related resilience strategies. However, climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1983 Master Plan Reexamination establishes a foundational goal to avoid development in environmentally critical areas, such as tidal marshes and floodplains, and to limit disturbance when avoidance is not feasible.
- The 1989 Master Plan Land Use Element Update expands on these ideas, recommending subdivision design standards that account for aesthetic and environmental factors, including clustering and buffers. It also introduced a Waterfront Concept Plan proposing the creation of a Wildlife Preserve district and tideland parklands, with an emphasis on passive recreation and public access. While innovative in terms of open space and access, these strategies were not framed in terms of climate adaptation, which was not a common practice at the time.
- The 1997 Master Plan Reexamination and 2005 Master Plan continue to prioritize environmental impact review and land stewardship, but do not explicitly address climate change risks. The 2005 Master Plan's Open Space and Recreation Plan and the 2006 OSRP both highlight the public purchase of environmentally sensitive lands. The Township's Open Space and Recreation Plan focuses on acquisition and connectivity of recreational lands and those of environmental value, again without linking these goals to broader climate resilience.
- Cinnaminson Township adopted a Municipal Stormwater Management Plan in December 2004, in accordance with NJDEP requirements. The plan sets forth policies and strategies to manage runoff, reduce flooding, protect water quality, and safeguard environmentally sensitive areas. It emphasizes the use of best management practices such as recharge, filtration, and erosion control. The plan was last revised in October 2006.
- The 2019 Master Plan Reexamination identifies the need to update stormwater regulations and develop an Open Space and Recreation Plan, but does not frame these updates in the context of climate change. A recommendation to pursue Sustainable Jersey certification was included, though specific actions related to climate mitigation or adaptation were not outlined.
- Chapter 290 Flood Damage Prevention

revised by Ord 2024-8, laid the policy and groundwork recognizing the Township's commitment to effective flood damage prevention as well as outlines the duties of the Township Floodplain Administrator. The Flood Damage Prevention Ordinance regulates all activities for development within the Township's Floodplains, ensuring the maintenance of general welfare and minimizing public and private losses due to flood events. The duties of the Floodplain Administrator include the authority to interpret Chapter 290 of the Township Code and to ensure consistency among development both with the Township ordinance and NJDEP regulations.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Cinnaminson Township has a high hazard rating for severe weather, a medium rating for dam failure, disease outbreak, extreme temperatures, and severe winter weather, and a low rating for drought, earthquake, flood, and wildfire. The Township demonstrates a strong adaptive capacity in dealing with disease outbreak, extreme temperatures, and severe winter weather; and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVI shows that Cinnaminson's higher-risk areas are located along the northern and western edge of the Township, adjacent to the Delaware River, Pennsauken Creek, and Pompeston Creek. Moderate-risk zones form between the waterbodies and the inland areas located in the central and southern areas of the Township. The lowest-risk areas are found in the southern and eastern portions of Cinnaminson, near the borders of Moorestown and Delran. The Cinnaminson River LINE station is located within the higher-risk and moderate-risk classification areas.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Cinnaminson Township contains a broad range of residential, commercial, and industrial zoning districts, with minimum lot sizes ranging from 1,300 square feet to 87,120 square feet. The Township includes multiple residential districts, some of which are designed for compact or cluster-style development, as well as several specialized commercial and industrial zones. Residential minimum lot sizes vary from 4,000 square feet in R-2CL to 87,120 square feet in BD-1. Commercial zones allow smaller lot sizes, with the Marine Commercial (MC) zone requiring only 1,300 square feet. **Table 6.4.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as condominium-style ownership and planned unit developments, the amount of land available for new subdivision can be totaled. Cinnaminson Township contains approximately 5,635 parcels and/or land masses across all zoning districts which do not face those restrictions above and have an estimated 131,000,000 square feet (or

about 3,000 acres) of unconstrained land capable of a complete buildout. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating possible buildout capacity using the zones' minimum lot area requirements.

Cinnaminson Township's buildout analysis identifies the "MC" Marine Commercial zone as having the greatest remaining capacity, with land available for an estimated 633 additional lots, and having the highest percent change from existing parcels to potential new parcels, as shown

TABLE 6.4.8: Cinnaminson Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-2CL (Residential Cluster)	4,000 square feet
R-4, R-4C	5,000 square feet
R-5	8,000 square feet
R-6	7,500 square feet
R-ICL	9,000 square feet
R-2A	11,475 square feet
R-3	11,250 square feet
R-2	15,000 square feet
BD-1 (Business Development/Senior Citizen Townhouse)	87,120 square feet (or 2 acres)
IR (Inclusionary Residential)	2,200 square feet
Commercial Zones' Minimum Lot Areas	
MC (Marine Commercial)	1,300 square feet
C	5,000 square feet
HC (Highway Commercial)	40,000 square feet
BD (Business Development)	40,000 square feet
Industrial Zones' Minimum Lot Areas	
IND	15,000 square feet
LI (Light Industrial)	50,000 square feet
Miscellaneous or Special Districts Not Considered in Buildout	
PUD (Planned Unit Development)	Not calculated due to alternative development patterns
P (Park)	Excluded from development potential
WP (Wildlife Preserve)	Excluded from development potential

TABLE 6.4.9: Cinnaminson Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
BD	127	10,997,903.53	252.48	5,000	275
BD-1	1	49,170.23	1.13	40,000	1
BD-1	87	514,742.36	11.82	15,000	6
BD-1	142	780,816.48	17.93	15,000	9
BD-1	1	136,762.65	3.14	2,200	2
C	13	65,590.29	1.51	50,000	13
C	13	156,512.77	3.59	50,000	31
C	2	201,355.11	4.62	50,000	40
C	2	473,638.04	10.87	50,000	95
C	2	373,207.87	8.57	50,000	75
C	5	247,995.76	5.69	1,300	50
C	4	215,788.09	4.95	1,300	43
C	3	142,337.07	3.27	1,300	28
C	1	88,913.05	2.04	1,300	18
HC	19	918,254.20	21.08		23
IND	3	35,952.25	0.83	9,000	2
IND	218	26,616,462.95	611.03	15,000	1,774
IR	5	1,066,396.68	24.48	15,000	485
LI	10	1,445,646.59	33.19	15,000	29
LI	51	1,078,217.01	24.75	15,000	22
LI	8	39,145.62	0.90	11,475	1
LI	1	13,119.91	0.30	11,475	0
LI	1	7,218.49	0.17	11,475	0
MC	10	526,418.36	12.08	11,475	405
MC	4	823,486.01	18.90	11,475	633
R-1CL	168	1,530,006.21	35.12	11,250	170

* *Maximum buildout hypothetical*

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
R-2	11	169,665.79	3.89	11,250	11
R-2	97	1,908,041.51	43.80	11,250	127
R-2	699	12,819,071.26	294.29	11,250	855
R-2	636	17,802,268.81	408.68	5,000	1,187
R-2A	198	2,592,772.34	59.52	5,000	226
R-2A	311	4,668,185.49	107.17	5,000	407
R-2A	225	3,322,541.68	76.28	8,000	290
R-2A	556	8,044,820.61	184.68	7,500	701
R-2A	170	2,701,330.01	62.01	7,500	235
R-2CL	1	372,271.17	8.55	5,000	93
R-2CL	4	716,222.37	16.44	40,000	179
R-3	100	1,048,503.42	24.07	15,000	93
R-3	156	2,228,224.02	51.15	15,000	198
R-3	92	1,960,732.14	45.01	2,200	174
R-3	998	14,010,310.29	321.63	50,000	1,245
R-3	5	70,899.62	1.63	50,000	6
R-4	75	616,524.88	14.15	50,000	123
R-4	46	418,148.87	9.60	50,000	84
R-4C	110	1,185,580.75	27.22	50,000	237
R-5	132	1,186,967.54	27.25	1,300	148
R-6	112	918,504.39	21.09	1,300	122

in **Table 6.4.9**. This unusually high figure is likely caused by the zone's minimum lot area requirement of only 1,300 square feet, which is significantly lower than what is typical for commercial uses and may not represent the intended character of development within the zone. Among residential districts, the R-2 CL zone has the most buildout potential, with land sufficient for up to 272 new residential lots.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/ industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage

perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

For twenty-five plus years, the New Jersey Superior Court has recognized that land is a scarce resource within Cinnaminson Township. Accordingly, in an effort to advance the highest and best use of parcels developed over 60 years ago, Township leaders have embarked on a comprehensive plan to identify and repurpose areas designated in need of rehabilitation and redevelopment. Such efforts have taken blighted areas and transformed them into vibrant, contributing community assets providing housing, assisted living, commercial and real enterprises. Key areas identified for these efforts include:

- The Route 130 Corridor Redevelopment will be business and age restricted housing. There will be four separate locations but generally from Cinnaminson Ave to Riverton Rd. Density is unknown, as it depends on the use.
- Transit Village in the East Riverton Section. This is residential development on Broad St from South Belleview Ave to Pear St. Density is 15 units per acre.
- Commercial development in proximity to a former Superfund site with the Industrial Zone along Taylors Ln. The primary use is logistics distribution/ warehousing.

ROUND IV OF AFFORDABLE HOUSING

The estimated Round 4 Prospective Need for Cinnaminson Township was 93 units of affordable housing, and the Township challenged that estimate through a Vacant Land Adjustment and achieved an agreement of an 89-unit Round 4 Obligation through the Affordable Housing Dispute Resolution Program. The township prepared a HEFSP and held a public hearing before the Planning Board on June 9, 2025, and approved the plan by Resolution # 2025-12. The Township Council subsequently endorsed the plan on June 18, 2025, by Resolution # 2025-82.

The Township prepared an HEFSP outlining several mechanisms to address its Round IV Obligation, including inclusionary development and overlay zoning. The inclusionary development consists of 130 market-rate units and 23 affordable units and is proposed at an existing residential development known as Cinnaminson Harbor. Wetlands are present on the site, and a conceptual site plan was not provided in the HEFSP. This site was determined to be suitable, approvable,

available, and developable in the HEFSP. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when applicable.

Resilience Strategy

Cinnaminson Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Cinnaminson Township.

> Cinnaminson Township recognizes the importance of protecting its natural resources, waterfront, and residential neighborhoods as part of a broader effort to build resilience in the face of a changing climate. The Township values its role as a long-term steward of its land, air, and water for the benefit of both current and future generations. A key goal is to guide redevelopment in ways that enhance community character while promoting resilience and sustainability. Cinnaminson aspires to preserve open space, farmland, and environmentally sensitive areas; expand access to the waterfront and recreational areas; and promote land use patterns that respect natural systems. The Township aims to invest in infrastructure improvements that reduce environmental impact and to support public and private efforts that align with climate adaptation and mitigation strategies. Through coordinated planning and an ongoing commitment to high-quality design and resource conservation, Cinnaminson seeks to shape a more sustainable and climate-conscious future.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

CINNAMINSON TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital

programs, grants, etc.).

- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.4.13: Cinnaminson Township municipal building. *(Source: CInnaminson Township)*



CINNAMINSON TOWNSHIP RESILIENCE ACTION

Second Phase Flood Mitigation in Parry

In the Parry section of town, along Pennsauken, the town has made stormwater improvements off the River on Adam and Jefferson Sts, repairing underground drainage that has failed. Phase 1 has been completed, and the Township is looking to study additional improvements in the area as Phase 2, including pursuing the dredging of Pennsauken Creek.

RESPONSIBLE PARTY	Cinnaminson Township, NJDEP
ESTIMATED COSTS	$1M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★★★

High

CINNAMINSON TOWNSHIP RESILIENCE ACTION

Public Outreach and Education about Flood Mitigation

Institute a public information campaign to increase outreach and education for residents related to flood risk mitigation strategies they can take on their own property, as well as things they can do to decrease local flooding risk. Education topics include home retrofit options, flood insurance, the impacts of dumping leaves and yard waste, and buyout options through NJDEP Blue Acres. Increasing participation in this program can remove vulnerable residents from flood-prone areas.

RESPONSIBLE PARTY Cinnaminson Township

ESTIMATED COSTS $10K - $250K+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium

CINNAMINSON TOWNSHIP RESILIENCE ACTION

Physical and Programmatic Actions to Reduce Extreme Heat

Physical actions, such as expanding the tree canopy, and programmatic actions, such as public heat resilience education, can be implemented to reduce impacts from Extreme Heat. Potential actions may include cool roof installations and cool pavement coatings, which use reflective materials to reduce heat absorption. The Township has also been discussing the creation of a splash park. Expansion of the tree canopy and shade structures in high-heat areas can improve shade and mitigate the heat island effect. Tree planting on both public and private properties can be promoted through incentive programs, volunteer planting events, and homeowner education. Finally, working with regional heat emergency operations planning and public education can help reduce the impacts of an extreme heat event, and may include working with regional partners in establishing cooling centers and developing outreach programs to empower residents to protect themselves.

RESPONSIBLE PARTY	Cinnaminson Township, Regional Partners
ESTIMATED COSTS	$50K - $250K+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★☆☆

Medium



CINNAMINSON TOWNSHIP RESILIENCE ACTION

Improve Local Drainage Infrastructure

Cinnaminson will conduct flood studies to identify and prioritize areas most vulnerable to flooding and determine appropriate mitigation strategies. The study will focus on known flood-prone locations, including the Jack's Run Tributary (extending from Parry to the border of Riverton) and the Fork Landing Rd area, which lies within the low-lying old farm section between Lenola Rd and Route 73. The Township will coordinate with NJDOT on ongoing easement realignment efforts and explore flood mitigation solutions such as stormwater basins and other improvements to reduce flood risk.

RESPONSIBLE PARTY	Cinnaminson Township, NJDOT
ESTIMATED COSTS	$3M+
POSSIBLE SOURCE(S) OF FUNDING	Grants, I-Bank



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

★★★☆☆

Medium

CINNAMINSON TOWNSHIP RESILIENCE ACTION

Stream Debris Management and Maintenance Coordination

The Township will develop a coordinated approach to address the regular accumulation of debris and fallen limbs within local streams, particularly in areas near rights-of-way where maintenance responsibilities are unclear. The town will work with property owners and other relevant partners to clarify jurisdiction, establish a maintenance schedule, and identify resources for debris removal. Regular monitoring and cleanup will help reduce blockages and improve drainage.

RESPONSIBLE PARTY	Cinnaminson Township
ESTIMATED COSTS	$0 - $50K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, Grants



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

★★★☆☆

Medium



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

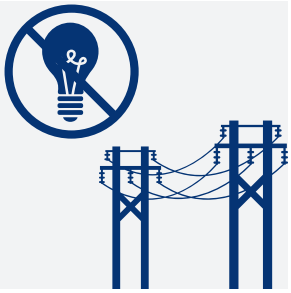


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



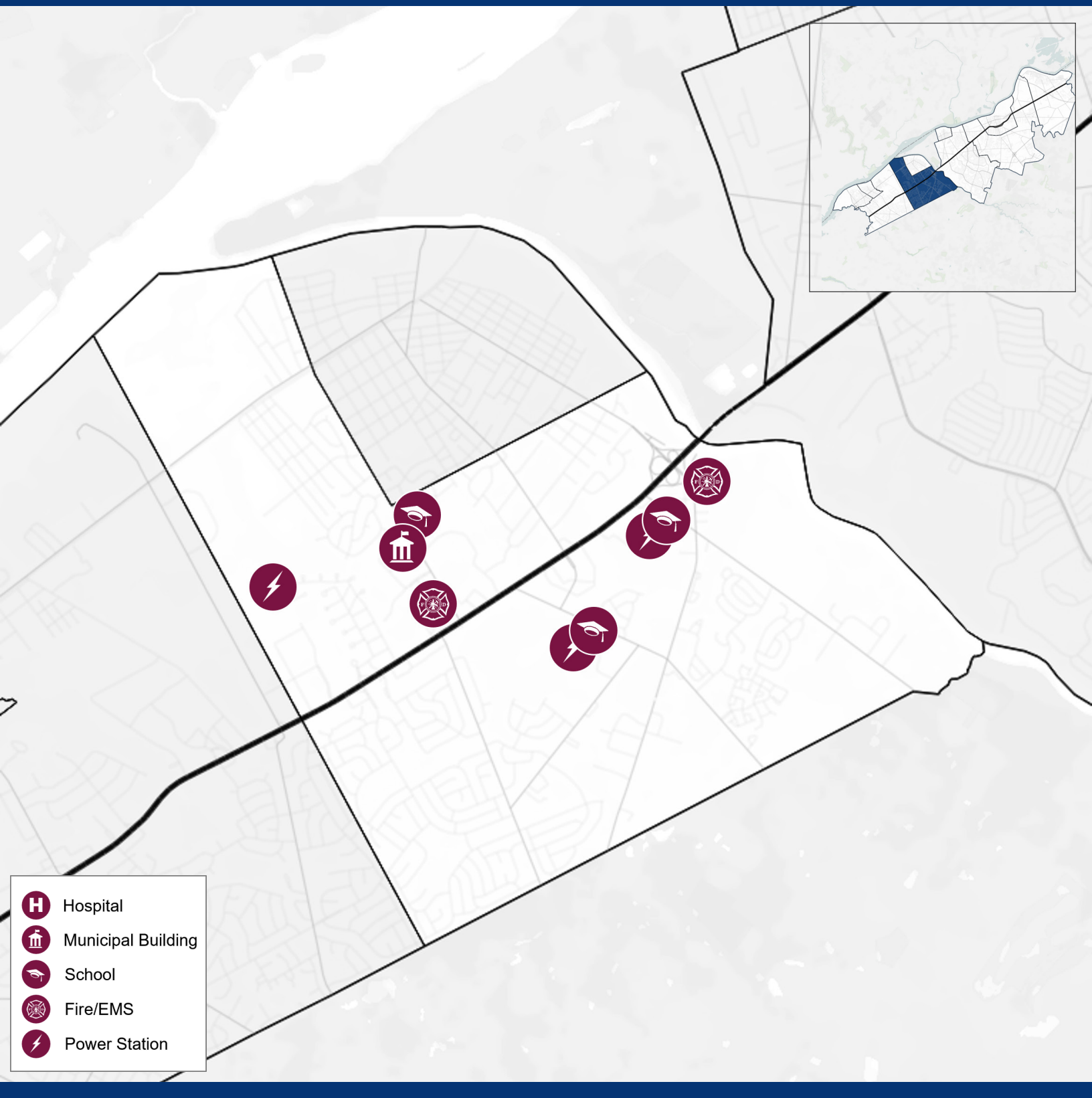
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.5: Delran Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Delran Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Delran Township and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Delran Township is north along the Delaware River, throughout the center of the Township along Swedes Run, and in the east along Rancocas Creek.



Sea Level Rise: Sea level rise is a notable and growing concern for Delran. The overall extent of sea level rise hazard exposure in the Township is low, but tidal inundation driven by sea level rise is concentrated in the north and east.



Heat: Delran Township has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Township can be found in the north, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Delran has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Delran is along the western and eastern borders.



Wildfire: Delran has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Delran is highest across the south as it has higher amounts of vegetated land compared to the northern end.



Drought: Delran Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Township ranges from slightly drought vulnerable to drought vulnerable land.

Resilience actions were developed to address risks identified in Delran Township's vulnerability assessment, and include:

- Riverbank Stabilization
- Improve Local Drainage and Stormwater Management Systems
- Mitigation of Riverside Park Flooding
- Public Outreach and Education about Flood Mitigation
- Expand Tree Canopy
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Located to the west and south of Riverside Township and east of Cinnaminson, Delran Township (the Township) has a population of 17,937. The northern extent of the Township fronts the Delaware River, and the eastern portion, the Rancocas Creek. Most of the waterfront portions of the Township are occupied by undeveloped natural wetlands, agricultural land, and open space areas such as Amico Island Park to the north and Plan Incent Anderson Farm to the east. The Township is roughly divided into a northern half and a southern half by Route 130 and is mostly built out with single-family residential uses. The Swede Run Tributary stream flows through the Township and poses a moderate flood risk with 100-year floodplain areas abutting it. The River LINE light rail passes through the northern portion of the Township but does not contain a station. **Table 6.5.1** shows socially vulnerable populations in Delran Township. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.5.1: Socially vulnerable populations in Delran Township.

DEMOGRAPHIC VARIABLE	DELRAN TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	17,937	--	9,267,014	--
Total Household Units	7,068	--	3,775,842	--
Occupied Housing Units	6,828	--	3,478,355	--
Vacant Housing Units	240	--	297,487	--
Population 18 or Younger	4,072	22.70%	2,031,322	21.90%
Population 65 or Older	2,794	15.58%	1,559,816	16.83%
Population with a disability	1,801	10.10%	975,308	10.60%

DEMOGRAPHIC VARIABLE	DELRAN TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons without a high school diploma	764	6.23%	600,736	9.30%
Persons below poverty level	1,397	7.79%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	3.80%	N/A*	6.20%
Persons uninsured	1,127	6.30%	682,266	7.40%
Persons who speak English "less than well"	638	3.81%	562,865	6.44%
Single Parent households	135	1.98%	198,943	5.72%
Minority Ethnicity (non-white)	4,641	25.87%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	791	11.19%	639,960	16.95%
Crowded housing units	57	0.83%	129,710	3.73%
Households with no vehicle	140	2.10%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Borough of Palmyra, Borough of Riverton, Cinnaminson Township, Delran Township, and Riverside Township took place on April 24th, 2025, from 6:30 to 8:30 p.m. Approximately 35 stakeholders attended the meeting, including the mayors of Delran, Borough of Riverton, Riverside, and various council members. Twenty community members were affiliated with Delran Township. Attendees from Delran were primarily concerned with issues of flooding and ineffective flood management systems. The widening of the Delaware River at the mouth of the Rancocas Creek also arose as a climate change-related concern, and Chester Ave was identified as a problem area. Stakeholders from Delran indicated that community recreation centers and the Delran Fire Company are their most valuable community assets, and that a resilient Delran would be one that is able to recover from and adapt to changing climatic

conditions and environments, a Delran that deploys more effective flood management and mitigation mechanisms such as levees and tiger damns, and a Delran that places lower priority on development.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

Nine attendees were from Delran Township. Flooding and heat were the top responses for hazards in the community. Other poll results mentioned critical infrastructure as an important asset to address. Programmatic actions and partnerships were identified as types of adaptation actions that would benefit the community. Improving public infrastructure and natural resource preservation were highlighted as secondary benefits.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Riverside and Delran in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Delran.

A representative from Delran highlighted that flooding issues impact Delran from North Chester Ave to Riverside Marina, which also impacts Riverside Township. A recent rain event had precipitation levels reaching 6-7 inches in a 45-minute period. Another issue raised is groundwater backup (a phenomenon in which groundwater backflow occurs, typically due to a blockage or obstruction) in Delran, and there was consensus that not enough emphasis is placed on mitigating groundwater-related issues. The conversation highlighted critical infrastructure, such as the wastewater treatment plant, which is located close to the Delaware River. The Township noted that while they don't see the facility as

immediately threatened, flooding at this facility may become an issue in the future. Two projects, one currently undertaken, one in consideration (see Resilience Actions section) are the USACE shoreline stabilization project and a potential study on Swedes Run. Swedes Run is a significant waterway, however, the Township's Public Works department, due to a NJDEP restriction, is not allowed to use equipment to remove the trees and other debris from the water; they are only allowed to clear debris manually.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed. The draft policy statements were also reviewed. Delran representatives highlighted the need to work with additional groups in developing resilience actions. The USACE and the Delaware River Basin Commission were both mentioned as potential partners for resilience projects.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them, a with munnd continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Flooding and sea level rise were noted as being the most important to the Delran municipality representatives. There are also heat-related hot spots in the community. There was a discussion about wildfire risk. There is a wooded area by Swedes Lake, but the model did not show a lot of concern in this area. It was discussed that the model is based on wildfire probability and is a larger-scale model for the state. Coastal communities can be vulnerable due to marshlands, as they can, and do, catch fire. Delran Township officials noted that flooding is experienced in the Swedes Lake and Swedes Run areas. Potential resilience actions discussed focused on flooding and sea level rise, as well as heat-related hot spots. Resilience actions to address flooding include bank stabilization, retrofitting to address flood mitigation for the sewage treatment plant, education and outreach to residents about flood mitigation, and stormwater management best practices to increase holding capacity (such as the addition of green infrastructure). To address heat impacts, an expanded tree-planting program was discussed. In looking at heat vulnerability, representatives noted that the spine along Chester Ave is hotter than other areas in the Township. Delran representatives noted that all regional resilience actions mentioned (continuation of road maintenance to respond to climate change impacts, stream clearing, bank stabilization, channel restoration, and coordinated response to widespread power outages) were important and confirmed their interest in these actions for their community.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

FIGURE 6.5.1: Delran Township municipal center. *(Source: Delran Township)*



Flooding

Flooding is a significant area of concern for residents and community leaders in Delran Township and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Delran Township is in the north along the Delaware River, throughout the center of the Township along Swedes Run, and in the east along Rancocas Creek. These areas represent 19% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Township (71%) is not within a modeled floodplain used in this analysis.

FIGURE 6.5.2: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.

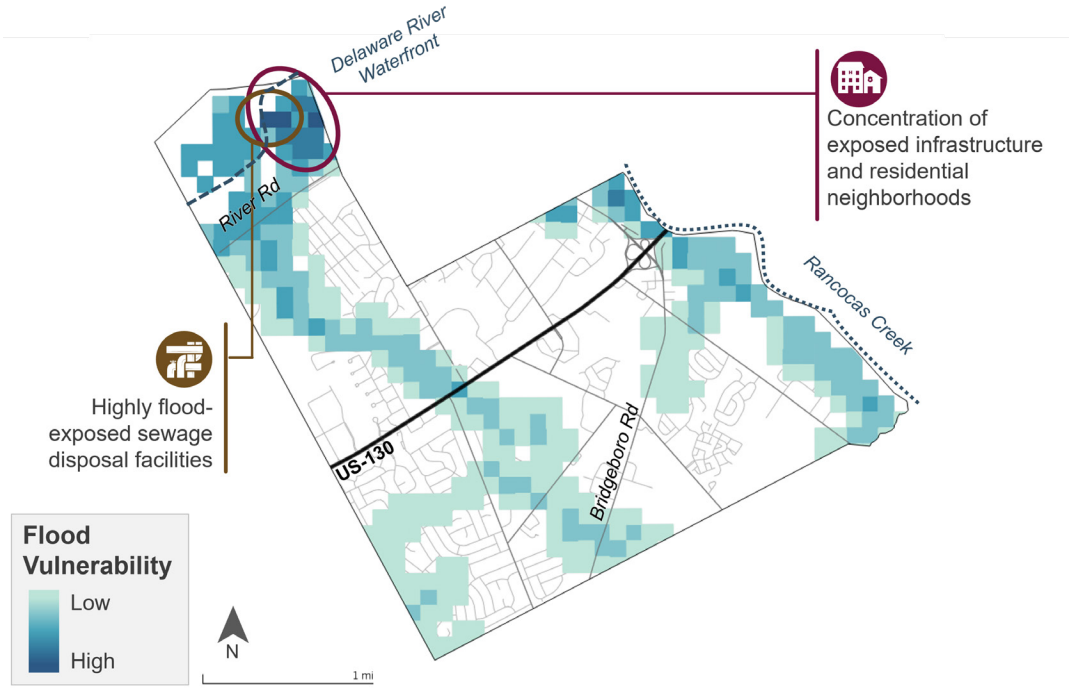


Figure 6.5.2 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.5.3: Flood exposure for four themes in Delran Township.



COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Delran Township, approximately 4%, or 198, of the 4,881 residential buildings are classified as having high flood exposure (within a 1% annual chance floodplain today), and 13%, or 61, of the 453 public and commercial buildings have high exposure, concentrated mostly in the north along the Delaware River. Nine acres of agricultural land in the Township is also considered to have high flood exposure, all of which is located in the eastern portion of the Township around Plan Incent Anderson Farm.



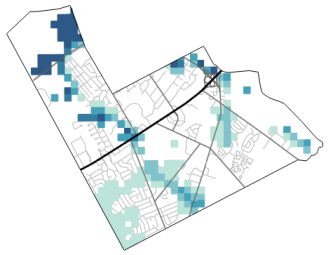
CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Delran Township, 38% of utility infrastructure has a high exposure to flooding, including Riverside Marina & Yacht Sales gas station. Additionally, Abrasive Alloy Casting Company is a hazardous material site with flood exposure where flooding can lead to material releases that can pose public health concerns and environmental damage. Four miles of transportation routes in the Township also have high flood exposure, and 0.5 miles of those are evacuation routes. Stewart Ave has the highest mileage exposed among roadways, with 0.4 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Delran Township, 164 acres, or 29%, of forests and shrublands are exposed to high levels of flooding, the majority of which are in the northwest along the Delaware River and in the east along Rancocas Creek. Similarly, 80% of wildlife habitat areas and 70% of wetlands are also within high flood exposure areas, concentrated in the east along Rancocas Creek. Wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the northwest have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River, Swedes Run, and in the east along Rancocas Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.5.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.5.2: Distribution of flood exposure scores for land area and assets in Delran Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	4,232 Acres	2,994 (71%)	317 (7%)	127 (3%)	795 (19%)
Community Resources					
Residential Buildings	4,881 Assets	4,259 (87%)	333 (7%)	91 (2%)	198 (4%)
Public & Commercial Buildings	453 Assets	352 (78%)	26 (6%)	14 (3%)	61 (13%)
Agricultural Land	175 Acres	145 (83%)	13 (7%)	8 (4%)	9 (5%)
Critical Infrastructure					
Utility Infrastructure	32 Assets	17 (53%)	1 (3%)	2 (6%)	12 (38%)
Health & Emergency Services	4 Assets	4 (100%)	--	--	--
Hazardous Material Sites	11 Assets	9 (82%)	1 (9%)	1 (9%)	--
Transportation Routes	80 Miles	69 (86%)	5 (7%)	2 (2%)	4 (5%)
Evacuation Routes	10 Miles	9 (91%)	0.2 (2%)	0.2 (2%)	0.5 (5%)
Natural Infrastructure					
Forests & Shrubland	560 Acres	343 (61%)	38 (7%)	15 (3%)	164 (29%)
Wildlife Habitat Areas	634 Acres	100 (16%)	11 (2%)	16 (3%)	507 (80%)
Wetlands	419 Acres	107 (25%)	14 (3%)	5 (1%)	293 (70%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a notable and growing concern for Delran. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware and Rancocas Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the north and east. Across the Township, 305 acres, or 7%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is low, as almost 90% of the land area is not exposed to sea level rise. Around the end of the century, 11% of the land area in the Township may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.5.4 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.5.4: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.



FIGURE 6.5.5: Sea level rise exposure for four themes in Delran Township.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Delran, 37 homes and 20 public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and 140 and 39, respectively, would be exposed at five feet of sea level rise. These buildings are concentrated in the northeast, especially along River Dr and St. Mihiel Dr. Additionally, only 5.9 acres of agricultural land, localized in the southeast, are exposed to tidal inundation with five feet of sea level rise.



CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Delran, 11 critical infrastructure assets and 2.2 miles of roadway are exposed to 4-5 feet of tidal inundation. This includes multiple sewage treatment plants.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 199 acres, representing 48%, of wetlands in the Township are exposed to 4-5 feet of tidal inundation, localized in the center of the Township along both Swedes Run and Lauren Run, and the greenspace near Delran High School and surrounding neighborhoods. Similarly, 20% of forests and shrublands, and 88% of wildlife habitat areas are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the northwest, which border the Delaware, and in the east that border the Rancoccas Creek have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.5.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.5.3: Distribution of sea level rise exposure scores for land area and assets in Delran Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	4,232 Acres	3,762 (89%)	20 (<1%)	43 (1%)	33 (1%)	38 (1%)	32 (15)	305 (7%)
Community Resources								
Residential Buildings	4,881 Assets	4,741 (97%)	42 (1%)	61 (1%)	31 (1%)	5 (<1%)	1 (<1%)	--
Public & Commercial Buildings	453 Assets	414 (91%)	9 (2%)	10 (2%)	16 (4%)	2 (<1%)	--	2 (<1%)
Agricultural Land	175 Acres	170 (97%)	2 (1%)	--	0.1 (<1%)	0.8 (<1%)	--	3 (1%)
Preserved Farmland	0 Acres	--	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	32 Assets	21 (66%)	7 (22%)	2 (6%)	2 (6%)	--	--	--
Health & Emergency Services	4 Assets	4 (100%)	--	--	--	--	--	--
Hazardous Material Sites	11 Assets	11 (100%)	--	--	--	--	--	--
Transportation Routes	80 Miles	78 (97%)	0.3 (<1%)	0.6 (1%)	0.3 (<1%)	0.3 (<1%)	0.2 (<1%)	0.3 (<1%)
Evacuation Routes	10 Miles	10 (98%)	--	--	--	--	--	0.2 (2%)
Natural Infrastructure								
Forests & Shrubland	560 Acres	451 (80%)	4 (1%)	7 (1%)	4 (1%)	10 (2%)	10 (2%)	74 (13%)
Wildlife Habitat Areas	634 Acres	140 (22%)	4 (1%)	9 (1%)	12 (2%)	13 (2%)	16 (3%)	440 (69%)
Wetlands	419 Acres	220 (52%)	1 (<1%)	7 (2%)	4 (1%)	8 (2%)	10 (2%)	169 (40%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Delran Township has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township can be found in the north. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 7% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 11% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.5.6 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.5.6: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.

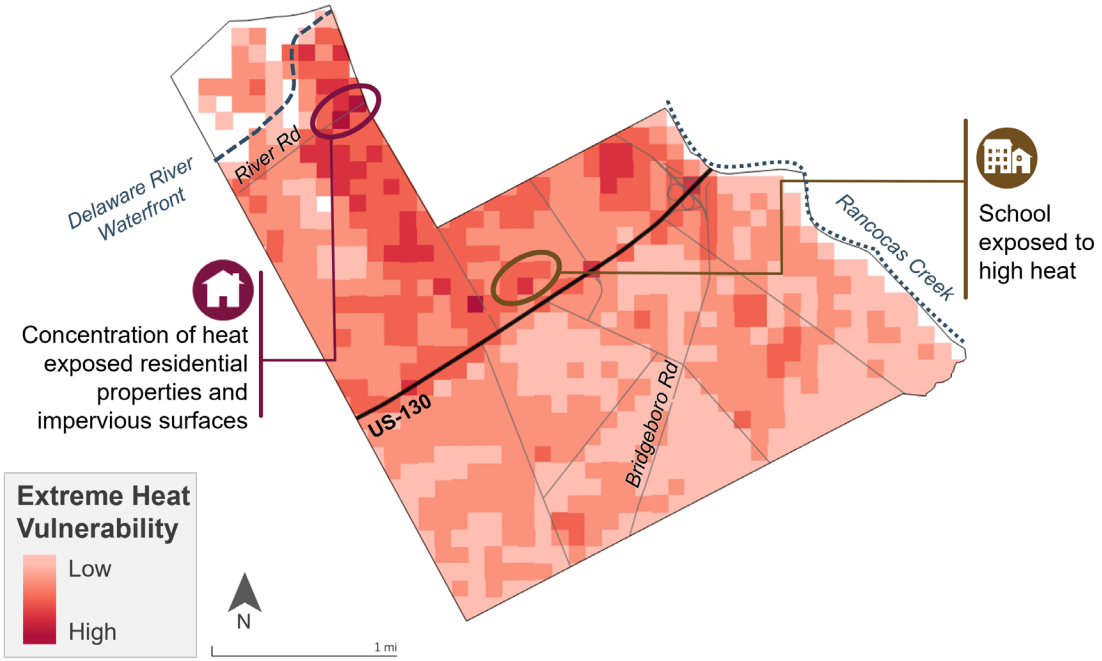
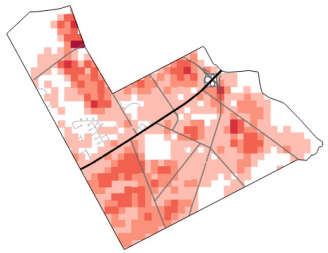
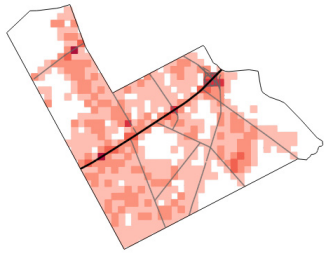


FIGURE 6.5.7: Heat exposure for four themes in Delran Township.



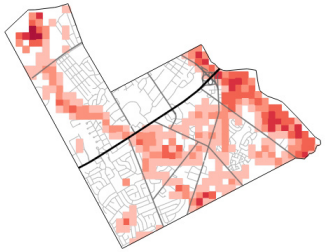
COMMUNITY RESOURCES

In Delran Township, 1% of residential buildings and 17% of public and commercial buildings have at least moderate-high heat exposure, concentrated in the north and in the center of the Township surrounding Burlington Pike. Six public or commercial buildings have particularly high measured heat exposure, including Holy Cross Preparatory Academy. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



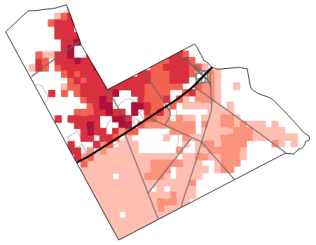
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 3% of utility infrastructure, 25% of health and emergency services, 27% of hazardous material sites, and 12% of transportation routes in the Township have at least moderate-high heat exposure, concentrated in the north and around Burlington Pike in the center of the Township. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events can stress and damage energy and transportation systems, which may widely impact surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Delran Township, 94% of forests and shrublands, 97% of wetlands, and 98% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are concentrated in the east along Rancocas Creek.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the north of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.5.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.5.4: Distribution of heat exposure scores for land area and assets in Delran Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	4,232 Acres	480 (11%)	1,645 (39%)	1,817 (43%)	256 (6%)	35 (1%)
Community Resources						
Residential Buildings	4,881 Assets	30 (1%)	1,756 (36%)	3,037 (62%)	58 (1%)	--
Public & Commercial Buildings	453 Assets	2 (<1%)	108 (24%)	263 (585)	74 (16%)	6 (1%)
Agricultural Land	175 Acres	11 (6%)	138 (79%)	26 (15%)	--	--
Critical Infrastructure						
Utility Infrastructure	32 Assets	--	14 (44%)	17 (53%)	--	1 (3%)
Health & Emergency Services	4 Assets	--	--	3 (75%)	1 (25%)	--
Hazardous Material Sites	11 Assets	--	4 (36%)	4 (36%)	3 (27%)	--
Transportation Routes	80 Miles	0.2 (<1%)	18 (22%)	52 (65%)	9 (11%)	0.8 (1%)
Evacuation Routes	10 Miles	0.2 (<1%)	1 (14%)	6 (61%)	2 (21%)	0.2 (2%)
Natural Infrastructure						
Forests & Shrubland	560 Acres	166 (30%)	304 (54%)	85 (15%)	5 (1%)	--
Wildlife Habitat Areas	634 Acres	478 (75%)	149 (23%)	7 (1%)	--	--
Wetlands	419 Acres	267 (64%)	139 (33%)	13 (3%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Delran has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Delran is along the western and eastern borders. Overall, 17% of the land area in the Township is considered exposed to landslides.

Figure 6.5.8 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.5.8: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.



FIGURE 6.5.9: Landslide exposure for four themes in Delran Township.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 8% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure and 0.08% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated along the eastern and western borders of the Township.



CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include multiple Land Mobile Private Towers, the Delran Fire District 1 Station 232, and multiple sewage disposal buildings. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are US-130, South Bridgeboro St, and FR CO 613.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 259 acres, or 26%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 2% of forests and shrublands and 1% of wetlands have between moderate and high exposure. Similarly, 209 acres, or 33%, of wildlife habitat areas also have known landslide exposure. These areas are along the eastern and western borders.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure that communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the north have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include those in the northwest.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.5.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.5.5: Distribution of landslide exposure scores for land area and assets in Delran Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	4,232 Acres	3,557 (84%)	412 (10%)	239 (6%)	25 (1%)	--	--
Community Resources							
Residential Buildings	4,881 Assets	4,506 (92%)	281 (6%)	91 (2%)	3 (<1%)	--	--
Public & Commercial Buildings	453 Assets	378 (83%)	39 (9%)	35 (8%)	1 (<1%)	--	--
Agricultural Land	175 Acres	160 (91%)	6 (4%)	9 (5%)	--	--	--
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	32 Assets	26 (81%)	1 (3%)	3 (9%)	2 (6%)	--	--
Health & Emergency Services	4 Assets	3 (75%)	1 (25%)	--	--	--	--
Hazardous Material Sites	11 Assets	7 (64%)	3 (27%)	1 (9%)	--	--	--
Transportation Routes	80 Miles	67 (84%)	10 (12%)	3 (4%)	0.7 (1%)	--	--
Evacuation Routes	10 Miles	6 (66%)	2 (15%)	1 (12%)	0.7 (7%)	--	--
Natural Infrastructure							
Forests & Shrubland	560 Acres	410 (73%)	80 (14%)	61 (11%)	10 (2%)	--	--
Wildlife Habitat Areas	634 Acres	425 (67%)	114 (18%)	76 (12%)	18 (3%)	--	--
Wetlands	419 Acres	310 (74%)	66 (16%)	40 (10%)	2 (1%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Delran has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Delran is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if infrastructure in Delran is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

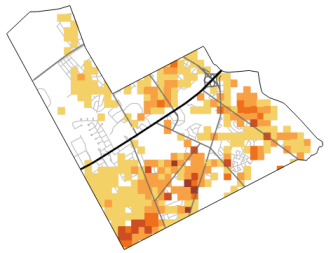
Wildfire potential in Delran is highest across the south as it has higher amounts of vegetated land compared to the northern end. These areas of relatively higher wildfire hazard potential are mostly forest and wetlands totaling over 1100 acres, but have about 175 acres of agricultural areas. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Across the Township, 9% of the land area has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.5.10: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.



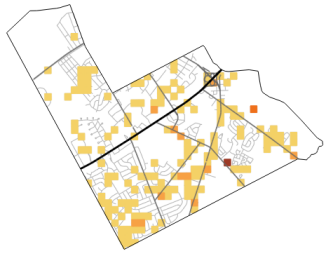
Figure 6.5.10 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.5.11: Wildfire exposure for four themes in Delran Township.



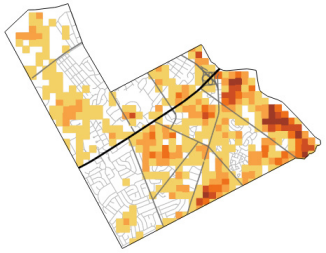
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Delran are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure, such as in the south along Swedes Run. Areas with higher density urban development have lower exposure. Around 2% of buildings and 11% of agricultural lands in the Township have an annual likelihood of burning of at least 0.05%. Agricultural land is also most exposed when adjacent to naturalized areas, such as in the southeast.



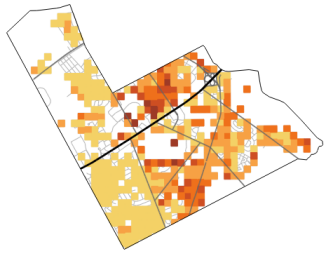
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas include four microwave towers. Roadways in more wildfire-prone areas include Bridgeboro Rd, Hartford Rd, Creek Rd, and Sycamore St. Although roads are less likely to be directly damaged by fire, they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and wetlands distributed across the inland parts of the southeast and wetlands in the east, concentrated along the Ranconcas Creek, have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Delran communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Delran in the surrounding areas can still cause harm to Delran residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the west near Swedes Run have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.5.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.5.6: Distribution of heat exposure scores for land area and assets in Delran Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	4,232 Acres	2,503 (59%)	224 (5%)	317 (7%)	800 (19%)	388 (9%)	--
Community Resources							
Residential Buildings	4,881 Assets	4,042 (83%)	123 (3%)	239 (5%)	370 (8%)	107 (2%)	--
Public & Commercial Buildings	453 Assets	402 (89%)	9 (2%)	6 (1%)	26 (6%)	10 (2%)	--
Agricultural Land	175 Acres	69 (39%)	--	--	86 (49%)	20 (11%)	--
Preserved Farmland	0 Acres	--	--	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	32 Assets	30 (94%)	--	--	2 (6%)	--	--
Health & Emergency Services	4 Assets	4 (100%)	--	--	--	--	--
Hazardous Material Sites	11 Assets	10 (91%)	--	--	1 (9%)	--	--
Transportation Routes	80 Miles	71 (89%)	1 (2%)	2 (2%)	4 (6%)	2 (2%)	--
Evacuation Routes	10 Miles	9 (90%)	--	0.1 (<1%)	0.7 (7%)	0.2 (2%)	--
Natural Infrastructure							
Forests & Shrubland	560 Acres	66 (12%)	95 (17%)	85 (15%)	225 (40%)	90 (16%)	--
Wildlife Habitat Areas	634 Acres	312 (49%)	55 (9%)	24 (4%)	243 (38%)	--	--
Wetlands	419 Acres	40 (10%)	23 (5%)	42 (10%)	198 (47%)	115 (27%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Delran Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Township ranges from slightly drought vulnerable to drought vulnerable land. Nearly half of the land area in the Township (48%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes are most concentrated in the eastern edge and the northwestern corner of the Township.

Figure 6.5.12 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.5.12: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Delran Township.

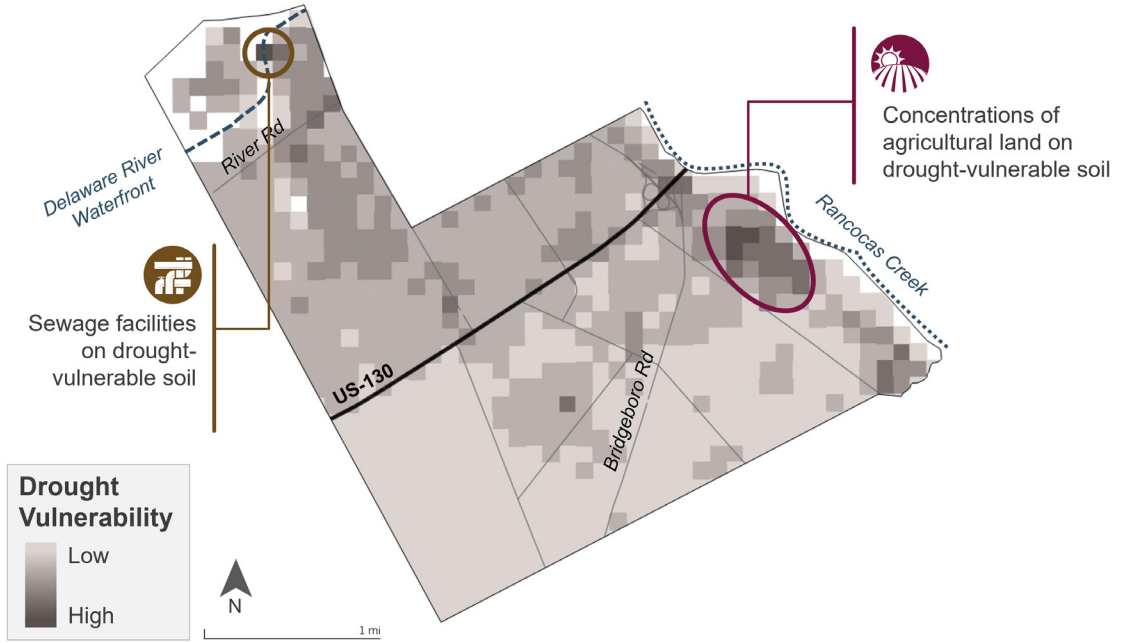
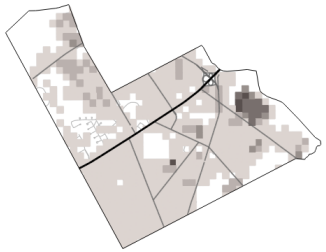
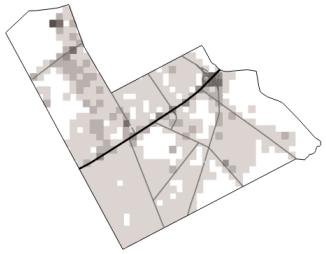


FIGURE 6.5.13: Drought exposure for four themes in Delran Township



COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. Around 18% of agricultural land in the Township is on drought-vulnerable soil, concentrated for the most part in the eastern portion of the Township. Nearly half of the buildings (42%) are also on land modeled to be drought-vulnerable, spread throughout, but concentrated mostly in the northern portion of the Township. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



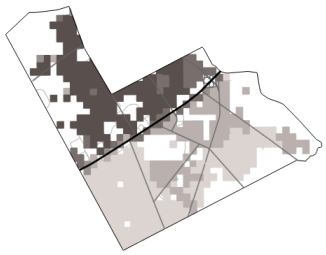
CRITICAL INFRASTRUCTURE

The majority of critical infrastructure assets in the Township are on drought-sensitive soil. Between 64% and 100% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, the majority of which are in the north. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Delran Township, 43% of wetlands and 46% of forests and shrublands are modeled to have drought-vulnerable soil, spread throughout the Township.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the north have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.5.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.5.7: Distribution of drought exposure scores for land area and assets in Delran Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	4,232 Acres	7 (<1%)	159 (4%)	1,444 (34%)	611 (14%)	2,011 (48%)
Community Resources						
Residential Buildings	4,881 Assets	6 (<1%)	93 (2%)	2,410 (49%)	429 (9%)	1,943 (40%)
Public & Commercial Buildings	453 Assets	3 (1%)	4 (1%)	92 (20%)	75 (17%)	279 (62%)
Agricultural Land	175 Acres	--	4 (2%)	63 (36%)	76 (43%)	32 (18%)
Critical Infrastructure						
Utility Infrastructure	32 Assets	--	1 (3%)	7 (22%)	2 (6%)	22 (69%)
Health & Emergency Services	4 Assets	--	--	--	--	4 (100%)
Hazardous Material Sites	11 Assets	--	--	2 (18%)	2 (18%)	7 (64%)
Transportation Routes	80 Miles	0.1 (<1%)	1 (1%)	32 (41%)	10 (13%)	36 (45%)
Evacuation Routes	10 Miles	0.1 (1%)	0.03 (<1%)	1 (10%)	3.5 (35%)	5.3 (53%)
Natural Infrastructure						
Forests & Shrubland	560 Acres	2 (<1%)	17 (3%)	160 (29%)	124 (22%)	257 (46%)
Wildlife Habitat Areas	634 Acres	104 (16%)	135 (21%)	43 (7%)	190 (30%)	162 (26%)
Wetlands	419 Acres	3 (1%)	122 (29%)	58 (14%)	54 (13%)	182 (43%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Delran Township's planning process has consistently integrated climate change concerns, particularly in its Master Plan and subsequent reexaminations, while not directly enumerating climate change hazards until more recently. These concerns stem from the Township's location along the Delaware River, making it susceptible to the predicted effects of rising sea levels and volatile weather patterns. Climate change concerns have also been addressed in State, county and regional initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- In its 1989 Master Plan Update, Delran emphasizes the need to preserve and protect environmentally sensitive areas through specific goals such as enhancing the natural character of the land and promoting stormwater management that mitigates pollution and reduces flood damage.
- The 1998 Master Plan Reexamination further solidifies this approach by calling for the restriction of residential development in areas prone to natural constraints, highlighting the importance of protecting wetlands and floodplains, and aligning with Blue Acres preservation principles.
- The Township's 2003 Master Plan Reexamination stresses the integration of smart growth techniques and the protection of the Township's varied natural resources, including forested areas and river frontage. This objective aligns with the Township's ongoing efforts to establish greenway corridors and protect stream and riverfront areas.
- Adopted in March 2005, Delran Township's Municipal Stormwater Management Plan encourages responsible development practices that protect local streams, wetlands, and groundwater recharge areas. The plan aligns with NJDEP stormwater rules and promotes pollutant reduction, erosion control, and flood mitigation. It was revised in July 2007.
- In the Township's 2009 Master Plan Reexamination, specific policy and recognition of climate change-related hazards are adopted. At the time, this acknowledgement and policy came in conjunction with reducing emissions in the Township. Specifically, the Reexamination Report states:

  > Delran Township shall develop a plan for reducing and mitigating its direct and indirect greenhouse gas (GHG) emissions. Direct emissions could be reduced through more efficient vehicles and the use of alternative fueled vehicles. Indirect emissions could be reduced through more efficient use of electricity and the use of renewable energy. Steps to mitigate GHG emissions could include increasing carbon sequestration capacity through

tree planting and preservation of established forested areas. Delran should work closely with the county, state, and private sector (electric utilities) initiatives to access resources for reducing and mitigating greenhouse gas emissions and addressing the effects of global climate change.

- Chapter 167, Flood Damage Prevention, amended in its entirety on May 14, 2024, by Ordinance No . 2024-11, establishes Delran Township's commitment to proactive flood hazard management . It outlines key policies for floodplain development and defines the responsibilities of the Township's Floodplain Administrator. The ordinance regulates all development within designated flood hazard areas to protect public safety and reduce property loss. The Floodplain Administrator is empowered to interpret this chapter and ensure compliance with both local and NJDEP standards.
- Chapter 303, Stormwater Management, amended in its entirety on December 10, 2024, by Ordinance No . 2024-24, establishes Delran Township's commitment to proactive stormwater management . It outlines key policies for major and minor development and defines the requirements that are to be adhered to within the Township. The ordinance regulates all development within the Township and establishes mitigation requirements for minor development. Two additions were a recharge requirement for certain minor development applications and new construction to maintain a 2' separate from the seasonal high water table (SHWT) for the lowest floor elevation.
- In the 2020 Master Plan Reexamination, the Township had updated its approach to climate change impacts, specifically recommending a Resiliency Master Plan Element to address the potential impacts of climate change, including the threat of rising flood levels. The 2022 Open Space & Recreation Plan Element further emphasized the need to protect natural areas, with a specific focus on preserving ecologically valuable areas such as the southern banks of the Rancocas Creek. Additionally, the plan highlighted the development of pedestrian walkways and bike trails as a way to encourage sustainable transportation and reduce reliance on automobiles.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Delran Township has a high hazard rating for severe weather; medium ratings for disease outbreak, drought, extreme temperatures, and severe winter weather; and low ratings for dam failure, earthquake, flood, and wildfire. The Township demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter weather; and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVA found that while a majority of the Township is classified as lower-risk, higher-risk and moderate-risk areas are present along the Township's Delaware River and Rancocas Creek waterfronts. There is a significantly higher-risk and moderate-risk area around Swedes Run, which starts near Dredge Harbor and Swedes Lake,

and extends south to the municipal boundary with Moorestown. There are no critical facilities in the municipality that are located in moderate- or higher-risk areas.

REGIONAL EFFORTS

- The 2017 CVA prepared by DVRPC outlines several recommendations and offers guidance related to climate resilience planning within the Township. The CVA highlights several Township assets and infrastructure such as the berm, outfall pipes, River Dr, Swedes Lake Dam, and the wastewater treatment plant. The first recommendation is to ascertain the structural vulnerability of Township-owned assets. Subsequent recommendations include the protection of the wastewater plant, outreach and assistance for Riverside Park residents, coordination regarding onsite contaminants, particularly on the former Abrasive Alloy Casting Company site, the preservation of open space and habitat along the Rancocas Creek, and further research regarding bridges over the Rancocas Creek.
- The CVA contains a variety of general recommendations, including targeted outreach to develop flood preparedness in existing residential areas prone to flooding and voluntary buy-outs of continually flooded property. Furthermore, the CVA recommends the following: incorporating coastal hazards in plans and regulations, long-range planning for coastal flooding, incorporating flood mitigation projects in capital improvement plans or hazard mitigation plans, undertaking a cost-benefit analysis of critical municipal assets, updating zoning and building codes, restoration of floodplain parcels to natural conditions, enhanced disaster preparedness, and general recommendations related to municipal organization and public outreach.

TABLE 6.5.8: Delran Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
PCD (Planned Commercial Development)	6,000 square feet
R-1 (Single Family Residence)	10,000 square feet
R-2 (One & Two Family Residence)	15,000 square feet
R-3 (Multi-Family Residence)	No lot size provided (excluded from buildout)
A-1 (Agricultural)	43,560 square feet (1 acre)
Commercial Zones' Minimum Lot Areas	
C-1 (Limited Retail & Services)	20,000 square feet
C-2 (General Commercial)	40,000 square feet
C-3 (Limited Commercial & Industrial)	20,000 square feet
NC-1 (Neighborhood Commercial 1)	12,500 square feet

ZONE	SQUARE FEET
NC-2 (Neighborhood Commercial 2)	10,000 square feet
O-1 (Office 1)	43,560 square feet (1 acre)
Industrial Zones' Minimum Lot Areas	
M-1 (Limited Industrial and Office)	43,560 square feet (1 acre)
M-2 (General Industrial and Commercial)	43,560 square feet (1 acre)
M-3 (Special Industrial and Commercial)	43,560 square feet (1 acre)
Special or Excluded Zones	
H (Harbor)	12,500 square feet; ***not*** excluded
Open Space	No minimum lot area assigned; excluded from buildout
R-3 (Multi-Family Residence)	Excluded from buildout due to absence of minimum lot size
R-3 (Multi-Family Residence)	Excluded from buildout due to absence of minimum lot size

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Delran Township contains a diverse set of residential, commercial, and industrial zoning districts, with minimum lot sizes ranging from 6,000 square feet to 43,560 square feet (or one acre). Residential zones include conventional single-family neighborhoods as well as planned communities. Commercial zones vary from limited retail and neighborhood centers to general and mixed-use areas. Industrial zones consistently require larger parcels, typically one acre, reflecting their intended intensity and land use characteristics. The Harbor district borders the Delaware River and carries a modest minimum lot size, though environmental sensitivities may influence its buildout feasibility. **Table 6.5.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns, such as condominium-style ownership and planned unit developments, the total amount of land available for new subdivisions can be determined. Delran Township contains 4,069 parcels and/or land masses across all zoning districts, which do not face those restrictions above, and has an estimated 101,846,964 square feet or 2,338 acres of unconstrained land capable of development. These values represent the base land inventory before applying site-specific limitations and serve as a starting point for calculating the buildout capacity using the zones' minimum lot area requirements.

The buildout analysis for Delran Township identifies the R-1 Residential District as having the greatest potential for development, as shown in **Table 6.5.9**. The R-1 zone contains sufficient land for the development of approximately 3,643.9 new lots. The other district with significant potential for development is the "H" Harbor district, which can accommodate up to

488 additional lots under current zoning standards. The Harbor district is situated along the Delaware River, where high-density development may not be advisable due to considerations related to waterway access and environmental sensitivity.

The R-2 zone is effectively built out, with 484 lots currently in existence and a total of 496.5 lots supported by the available land. This reflects close alignment between existing development and zoning expectations, with little additional buildout potential projected.

The A-1 Agricultural district also has development potential with 372 more lots than currently exist and would be permitted under the district's one-acre minimum lot size requirement. This condition is primarily attributable to planned unit developments within the zone, which are not accounted for in the standard buildout analysis methodology. As a result, the apparent overbuilding is a misrepresentation of actual zoning compliance and the development intent.

Overall, Delran Township's buildout analysis yields a potential net increase

TABLE 6.5.9: Delran Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
A-1	131	21,916,663.75	131	43,560	503.14
C-1	11	277,707.03	11	20,000	6.38
C-2	34	8,747,259.96	34	40,000	200.81
C-3	2	449,146.77	2	20,000	10.31
H	22	6,375,582.56	22	12,500	146.36
M-1	4	900,015.33	4	43,560	20.66
M-1	55	1,700,621.06	55	43,560	39.04
M-1	6	554,458.51	6	43,560	12.73
M-2	12	9,001,114.51	12	43,560	206.64
M-3	35	2,435,566.36	35	43,560	55.91
NC-2	6	648,017.31	6	10,000	14.88
PCD	1,018	2,881,534.45	1018	6,000	66.15
R-1	204	21,472,738.21	204	10,000	492.95
R-1	179	14,966,421.42	179	10,000	343.58
R-2	242	2,876,348.08	242	15,000	66.03
R-2	242	3,017,184.27	242	15,000	69.27

* *Maximum buildout hypothetical*

of approximately 2,272.7 lots across all zoning districts. This figure includes the overrepresented A-1 district, indicating that existing lots in the Township are generally larger in area than what the existing zoning minimums allow.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The city has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Township has the following redevelopment areas noted.

- Rancocas St Affordable Housing Development (former Abrasive Alloy site): Located behind the fire station, this will accommodate 65 units, all affordable. This area is closer to the river and could be vulnerable to flooding.
- Route 130 Affordable Housing Development, Atlantic Delta Development: Located off Route 130, next to the Home Depot, this development will accommodate 240 units, with 18% affordable (48 units). This area is on high ground and is not at risk of flooding.

ROUND IV OF AFFORDABLE HOUSING

The estimated Round IV present need obligation is 40 units, and the prospective need obligation is 96 units. On January 29, 2025, Delran Township Council adopted Resolution 2025-41, and on May 16, 2025, the Delran Planning Board adopted the Housing Element & Fair Share Plan Round IV (2025-2035). Delran Township will address the 40-unit present need obligation through participating in the Burlington County owner-occupied rehabilitation program and will fund a municipal rehabilitation program.

Three mechanisms will address the prospective need for Delran: A Hunter's Glen 18-unit expansion for seniors (Block 9 Lot 46), a separate Hunter's Glen 21-unit expansion for families (Block 9 Lot 47.05), and a 72-unit program to extend expiring controls. The two Hunter's Glen projects are free of any environmental encumbrance, such as wetlands or steep slopes, and are located outside of the SFHA. On June 24, 2025, the Delran Township Council adopted Resolution 2025-185 endorsing the Housing Element & Fair Share Plan Round IV (2025-2035).

Resilience Strategy

Delran Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Delran Township.

> Delran Township strives to balance sustainable growth with strong stewardship of its natural resources. Delran seeks to maintain safe, healthy, and stable neighborhoods while enhancing recreation and open space. The Township endeavors to guide development and redevelopment while protecting wetlands, floodplains, forests, and wildlife habitats in the process. A key goal is to maximize the preservation of natural landscapes that provide critical environmental benefits such as flood control, drainage, and habitat protection. Delran also recognizes the value of agriculture as both an economic asset and a natural resource for present and future generations. Investments in infrastructure and transportation aim to support efficient movement while minimizing environmental impact, all within a vision of resilient and balanced community growth.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

DELRAN TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

DELRAN TOWNSHIP RESILIENCE ACTION

Riverbank Stabilization

Implement riverbank stabilization measures to reduce erosion for shorelines near the Riverside Park neighborhood. This may include reinforcing eroding riverbanks with native vegetation, riprap, or engineered retaining structures to avoid the risk of landslides. Stabilized banks prevent further erosion, protect nearby properties, and reduce sedimentation in waterways. Vegetated solutions also improve water quality and habitat conditions. For private properties, programs may be set up to support and incentivize action on private land.

RESPONSIBLE PARTY	Delran Township, NJDEP, USACE
ESTIMATED COSTS	$100K - $5M+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP, USACE



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

★★★★★

High



DELRAN TOWNSHIP RESILIENCE ACTION

Improve Local Drainage and Stormwater Management Systems

During periods of high water in nearby waterways, the community's outfalls that discharge into tidal waterways become impacted, potentially preventing stormwater from discharging properly. This causes stormwater backup in streets such as Stewart Ave and Norman Ave, leading to localized flooding. The town seeks to implement drainage infrastructure improvements and stormwater management best practices to increase local storage and infiltration capacity where feasible, reduce peak flows, and improve the overall performance of the drainage network. These can include green infrastructure and nature-based solutions where possible.

RESPONSIBLE PARTY	Delran Township
ESTIMATED COSTS	$250K - $1M+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-10 years

PRIORITY RATING

★★★★★

High

DELRAN TOWNSHIP RESILIENCE ACTION

Mitigation of Riverside Park Flooding

Coordinate with the chief operator at the Sewage Treatment Plant to support the mitigation of flood risks to the Plant via retrofit and design to protect structures from future flood damage. This can include wet and dry floodproofing, and deployable flood barriers such as a Tiger Dam. Coordinate with USACE, Burlington County, and project stakeholders to support the mitigation of flood risks to the Riverside Park neighborhood, including the Township's wastewater treatment plant, via shoreline flood protection structures from future flood damage.

RESPONSIBLE PARTY Delran Township

ESTIMATED COSTS $500K - $5M+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, Burlington County, Adjacent Municipalities, NJDEP, USACE



ESTIMATED TIMELINE

5-10 years

PRIORITY RATING

★★★★★

High

DELRAN TOWNSHIP RESILIENCE ACTION

Public Outreach and Education about Flood Mitigation

Institute a public information campaign to increase outreach and education for residents related to flood risk mitigation strategies they can take on their own property, as well as things they can do to decrease local flooding risk. Education topics include home retrofit options, flood insurance, the impacts of dumping (historically, dumping of leaves and yard waste has led to blocked drains and increased flooding during rainfalls), and buyout options through NJDEP Blue Acres. Increasing participation in this program can remove vulnerable residents from flood-prone areas.

RESPONSIBLE PARTY Delran Township

ESTIMATED COSTS $10K - $250K+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium

DELRAN TOWNSHIP RESILIENCE ACTION

Expand Tree Canopy

Expand the tree canopy in high heat areas, such as near the municipal building, the local school, and Simon and Schuster Development, to improve shade and reduce the heat island effect. Promote tree planting on both public and private properties through incentive programs, volunteer planting events, and homeowner education.

RESPONSIBLE PARTY Delran Township

ESTIMATED COSTS $50K - $250K+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP, and potential support available through programs run by TD Bank and Sustainable Jersey



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

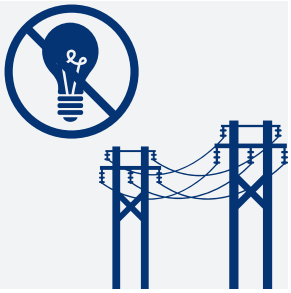


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



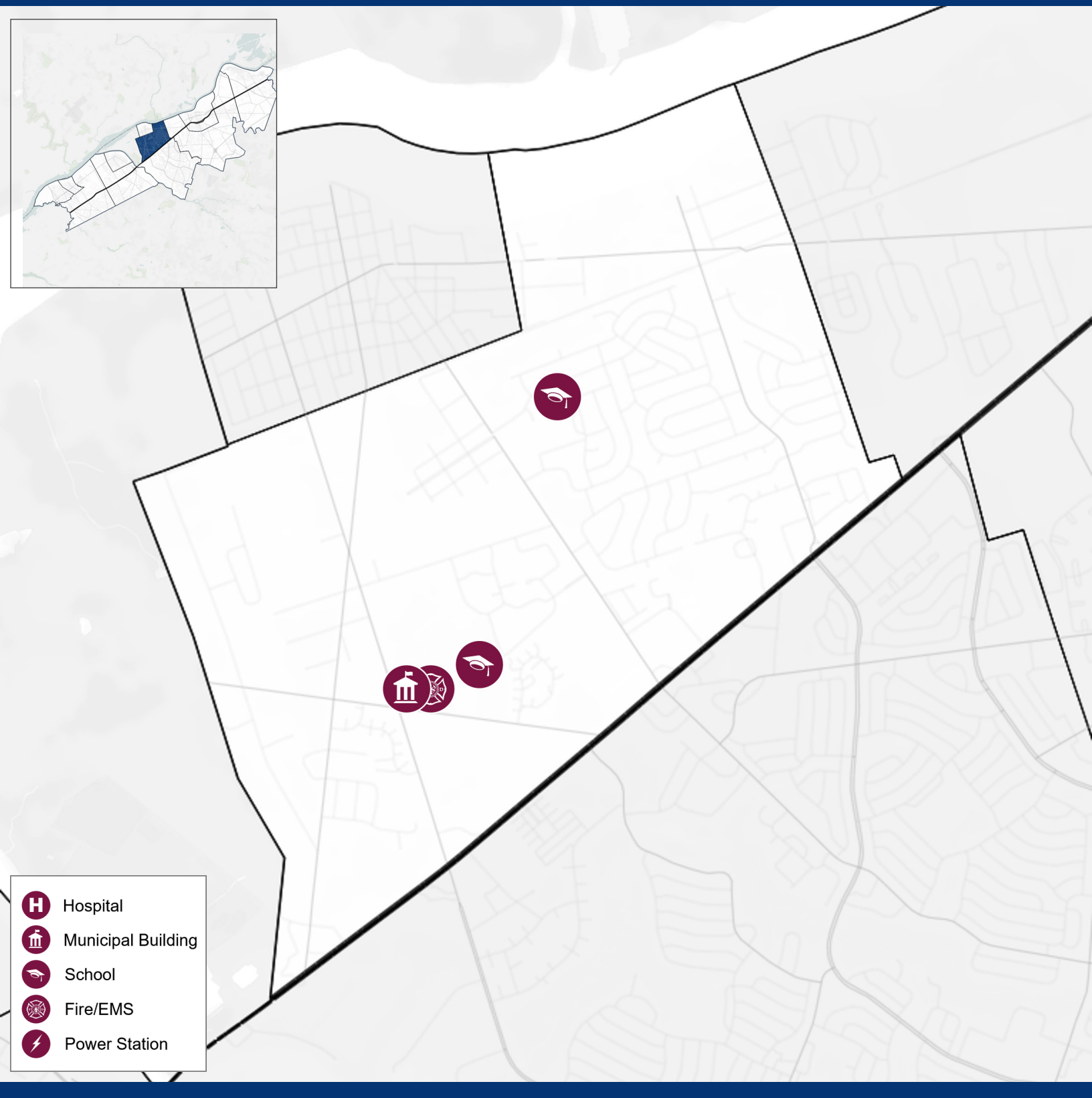
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.6: Edgewater Park Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Edgewater Park Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: While Edgewater Park Township is not as widely exposed to flooding as other hazards, it can still be a source of direct and indirect risk for assets and residents alike. The majority of flood exposure in Edgewater Park Township can be found in the northeast along the Delaware River and in the northwest corner of the Township.



Sea Level Rise: Sea level rise is a small yet growing concern for Edgewater Park. The overall extent of sea level rise hazard exposure in the Township is very low, but tidal inundation driven by sea level rise is concentrated in the northwest near some green space and in the northeast, near the Delaware.



Heat: Edgewater Park Township has an overall high risk oeme heat compared to other hazards. Areas with the highest heat exposure in the Township can be found throughout the central portion of the Township, and are generally caused by high amounts of impervious surfaces and lower amounts of green space in these areas.



Landslide: Edgewater Park has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Edgewater Park is along the northern and southern borders.



Wildfire: Edgewater Park has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Edgewater Park is highest in the northeast corner of the Township.



Drought: Edgewater Park Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Edgewater Park Township ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Edgewater Park Township's vulnerability assessment, and include:

- Drainage Improvements at Bogg's Run
- Adams Ave Basins Consolidation, Pump Station, and Generator
- Multi-Municipal Flood Resilience Coordination
- Participate in NOAA's StormReady Program
- Educate Residents on Disease Outbreaks
- Community Center Emergency Services Planning Initiative
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Edgewater Park Township (the Township) is situated north of Willingboro Township and contains a population of 8,949. A portion of the northeast part of the Township abuts the Delaware River, though most of the Township is situated between Route 130 and the River LINE light rail. The Township is predominantly single-family residential but contains Beverly National Cemetery, a large military cemetery and listed historic property, as well as the out-of-use Wall Rope Works building, once the largest manufacturer of rope products for the US military, and also a historic property. The Township shares a River LINE light rail station with Beverly City to the north. **Table 6.6.1** shows socially vulnerable populations in Edgewater Park Township. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.6.1: Socially vulnerable populations in Edgewater Park Township.

DEMOGRAPHIC VARIABLE	EDGEWATER PARK TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	8,949	--	9,267,014	--
Total Household Units	4,014	--	3,775,842	--
Occupied Housing Units	3,776	--	3,478,355	--
Vacant Housing Units	238	--	297,487	--
Population 18 or Younger	1,640	18.30%	2,031,322	21.90%
Population 65 or Older	1,656	**18.50%**	1,559,816	16.83%
Population with a disability	1,355	**15.10%**	975,308	10.60%
Persons without a high school diploma	343	5.09%	600,736	9.30%

DEMOGRAPHIC VARIABLE	EDGEWATER PARK TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons below poverty level	1,647	**18.43%**	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	5.00%	N/A*	6.20%
Persons uninsured	481	5.40%	682,266	7.40%
Persons who speak English "less than well"	336	4.10%	562,865	6.44%
Single Parent households	26	0.69%	198,943	5.72%
Minority Ethnicity (non-white)	4,196	46.89%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	704	17.54%	639,960	16.95%
Crowded housing units	97	2.57%	129,710	3.73%
Households with no vehicle	255	6.80%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments. While Edgewater Park residents did not participate in the meetings, comments were provided for the Township on the online map. Edgewater Park municipal staff actively attended all meetings.

Community Meetings

The public meeting for the City of Beverly, and the Townships of Edgewater Park and Willingboro took place on April 22nd, 2025, from 6:00 to 8:00 p.m. Approximately 10 stakeholders attended the meeting, none of whom were affiliated with the Township of Edgewater Park. No comments were received on behalf of the Township of Edgewater Park at the meeting.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show

presentation, five interactive polls, and a question-and-answer portion.

No attendees were from Edgewater Park Township, and no questions/comments or poll results about Edgewater Park Township were received during this meeting.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Beverly City, Edgewater Park, and Willingboro in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Edgewater Park.

Discussion from Edgewater Park during this meeting centered on communication between, and working across, municipalities, looking at ways one municipality's resilience action may impact another, and at ways more than one municipality may tackle these climate change challenges. Some challenges facing Edgewater Park residents include the flooding at Silver Park West, a 55+ community where the retention pond cannot be expanded. Heat impacts were also highlighted, along with the need for Burlington County to establish regional cooling/heating/EMS sites.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed, and the information needed for the development of all actions was discussed. The draft policy statements were also reviewed.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key

findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them, and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Edgewater Park representatives highlighted stormwater issues, noting the flooding in Silver Park West, despite the retention pond. The municipality has applied for federal funding as a pump station and discharge pond are needed. The Township noted that in terms of stream cleaning, a major problem area exists off Perkins Ln. The creek backs up and floods homes in Edgewater Park. The municipality has coordinated with the County to remove the debris. The Township discussed seven potential resilience actions: (1) Bogg's Run, (2) and (3) Adams Ave Basins (two projects), (4) expanding stormwater infrastructure at the Silver Park West retention pond, (5) coordinating with other municipalities about flooding issues, (6) participating in the NOAA Storm Ready program, and (7) beginning to conduct meetings to determine what emergency services can be provided at the community center.

Map and Survey Comments

The Project Team received nine points of information for Edgewater Park Township, noting problem areas, assets, climate concerns, and resilience visioning. Flooding, poor drainage, wind, and heat were noted. Commenters also noted parks and sports venues, storm frequency and intensity, new construction design, and data needs. Commenters envisioned a future that includes all the towns participating with the county and state in a plan for resilience.

MAP COMMENTS

- **Warren St East**, underneath the train bridge, was noted as a problem area for flooding.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

RESILIENCE VISIONING COMMENTS

What does resilience mean to you?

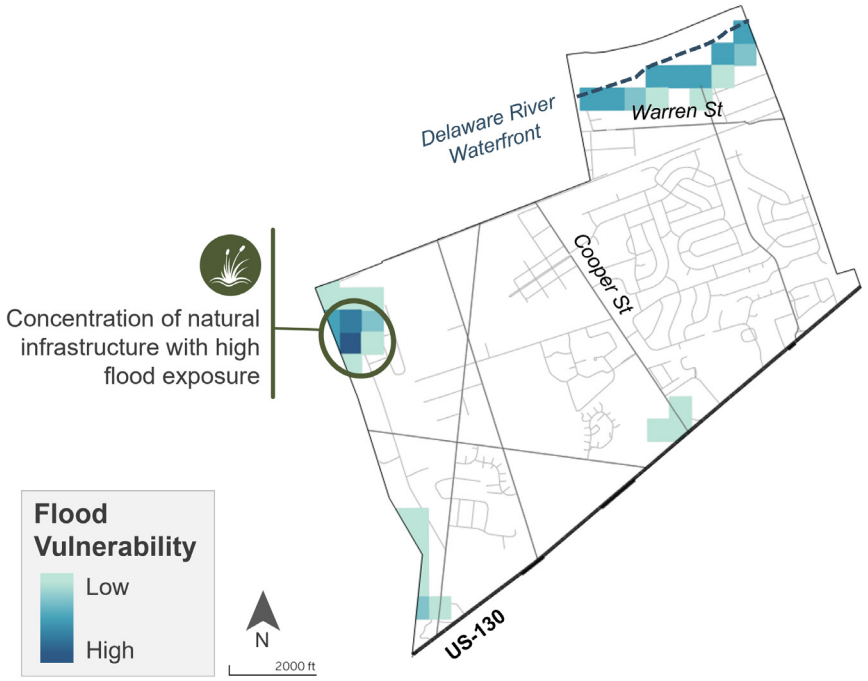
A coordinated effort by all parties to identify and prepare a plan to address climate change and its effect on towns, the County, and the State. Each of these entities must work together to ensure that climate change impacts are mitigated.

Flooding

While Edgewater Park Township is not as widely exposed to flooding as other hazards, it can still be a source of direct and indirect risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Edgewater Park Township is in the northeast along the Delaware River and in the northwest corner of the Township.

FIGURE 6.6.1: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.



These areas represent 2% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Township (97%) is not within a modeled floodplain used in this analysis.

Figure 6.6.1 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.6.2: Flood exposure for four themes in Edgewater Park Township.



COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Edgewater Park Township, less than 1%, or 1 of the 2,150 residential buildings in the Township are classified as having high flood exposure (within a 1% annual chance floodplain today), and 0% of the 254 public and commercial buildings have high exposure. No agricultural land in the Township is considered to have high flood exposure.

CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Edgewater Park Township, none of the utility infrastructure, health and emergency service facilities, and hazardous material sites have a high exposure to flooding. Only 0.1 miles of transportation routes in the Township also have high flood exposure, none of which are evacuation routes. Perkins Ln is the only roadway exposed in the Township, with 0.04 miles of roadway exposed to a 1% annual chance flood.

NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Edgewater Park Township, one acre, or 1%, of forests and shrublands in the Township are exposed to high levels of flooding, a small portion of which is in the northeast, near Woodlane Rd, and another small portion of which is in the northwest, off Perkins Ln. Additionally, 65% of wetlands are also within high flood exposure areas, all of which are in the northwest corner of the Township, but wetlands are even more resilient to flooding effects than other asset types.

SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the northeast and northwest have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.6.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.6.2: Distribution of flood exposure scores for land area and assets in Edgewater Park Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	1,868 Acres	1,808 (97%)	14 (1%)	14 (1%)	31 (2%)
Community Resources					
Residential Buildings	2,150 Assets	2,139 (99%)	4 (<1%)	6 (<1%)	1 (<1%)
Public & Commercial Buildings	254 (Assets	252 (99%)	1 (<1%)	1 (<1%)	--
Agricultural Land	187 Acres	179 (96%)	4 (2%)	4 (2%)	--
Critical Infrastructure					
Utility Infrastructure	7 Assets	7 (100%)	--	--	--
Health & Emergency Services	4 Assets	4 (100%)	--	--	--
Hazardous Material Sites	2 Assets	2 (100%	--	--	--
Transportation Routes	41 Miles	40 (99%)	0.1 (<1%)	0.2 (1%)	0.1 (<1%)
Evacuation Routes	3 Miles	3 (100%)	--	--	--
Natural Infrastructure					
Forests & Shrubland	172 Acres	169 (98%)	0.2 (<1%)	2 (1%)	1 (1%)
Wetlands	172 Acres	169 (98%)	0.2 (<1%)	2 (1%)	1 (1%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a small yet growing concern for Edgewater Park. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the northwest near some green space and in the northeast, near the Delaware. Across the Township, 16 acres, or 1%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is very low, as nearly 99% of land in the Township is not at all affected by sea level rise, even towards the end of the century with five feet of sea level rise.

Figure 6.6.3 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.6.3: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.

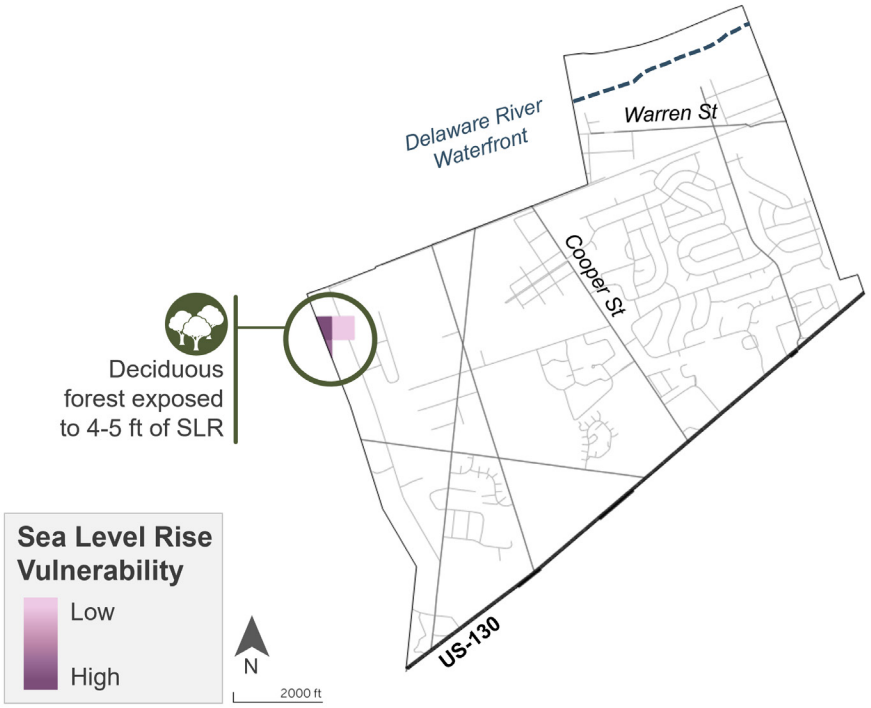
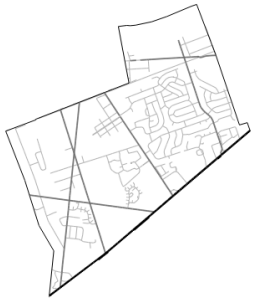
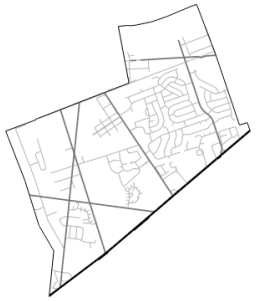


FIGURE 6.6.4: Sea level rise exposure for four themes in Edgewater Park Township.



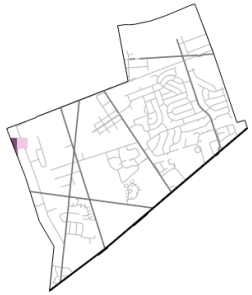
COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. However, in Edgewater Park, no homes, public, or commercial buildings are modeled to be exposed to tidal inundation at up to five feet of sea level rise. Additionally, no acres of agricultural land are exposed to tidal inundation at up to five feet of sea level rise.



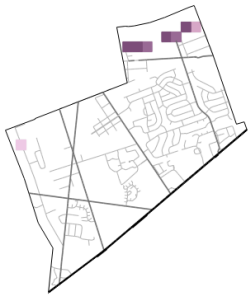
CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. However, in Edgewater Park, no critical infrastructure assets or roadways are exposed to 4-5 feet of tidal inundation.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels—wetlands are known to migrate inland with rising sea levels if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 0.6 acres, representing 15% of wetlands in the Township, are exposed to 4-5 feet of tidal inundation, localized on the northwest corner. Similarly, <1% of forests and shrublands are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the northwest along the coast of the Delaware have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.6.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.6.3: Distribution of sea level rise exposure scores for land area and assets in Edgewater Park Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	1,868 Acres	1,847 (99%)	--	4 (<1%)	1 (<1%)	--	--	16 (1%)
Community Resources								
Residential Buildings	2,150 Assets	2,150 (100%)	--	--	--	--	--	--
Public & Commercial Buildings	254 (Assets	254 (100%)	--	--	--	--	--	--
Agricultural Land	187 Acres	187 (100%)	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	7 Assets	7 (100%)	--	--	--	--	--	--
Health & Emergency Services	4 Assets	4 (100%)	--	--	--	--	--	--
Hazardous Material Sites	2 Assets	2 (100%)	--	--	--	--	--	--
Transportation Routes	41 Miles	41 (100%)	--	--	--	--	--	--
Evacuation Routes	3 Miles	3 (100%)	--	--	--	--	--	--
Natural Infrastructure								
Forests & Shrubland	172 Acres	172 (99%)	--	1 (<1%)	--	--	--	--
Wetlands	4 Acres	4 (85%)	--	1 (15%)	--	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Edgewater Park Township has an overall high risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township can be found throughout the central portion of the Township. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 14% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 4% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.6.5 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.6.5: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.

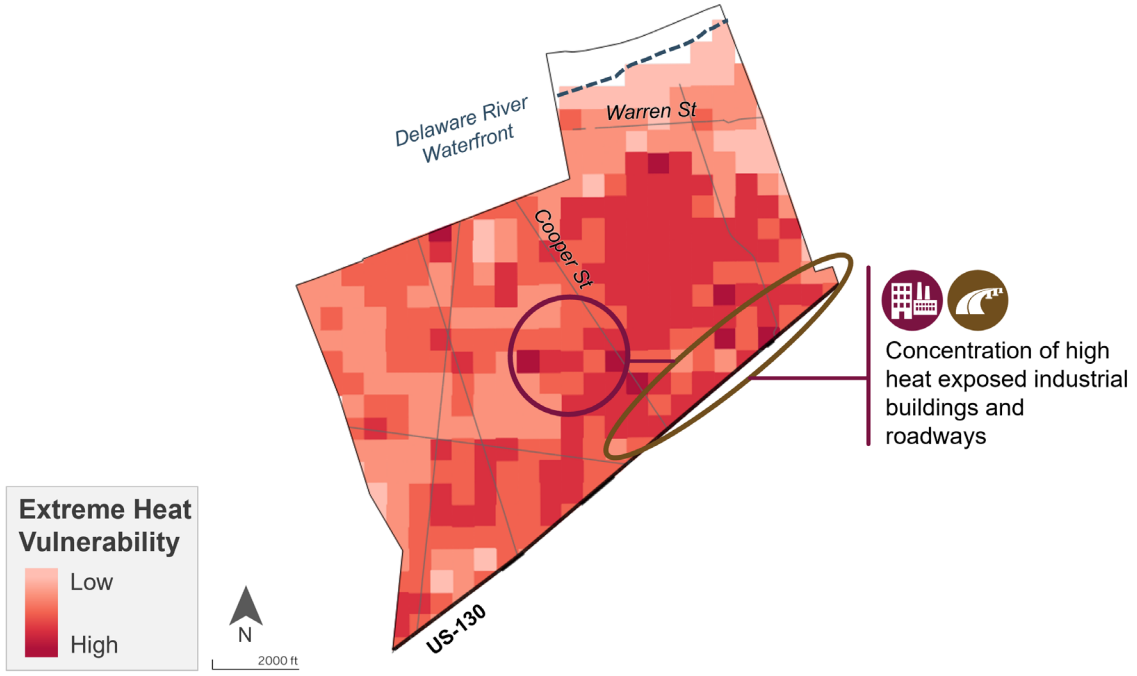
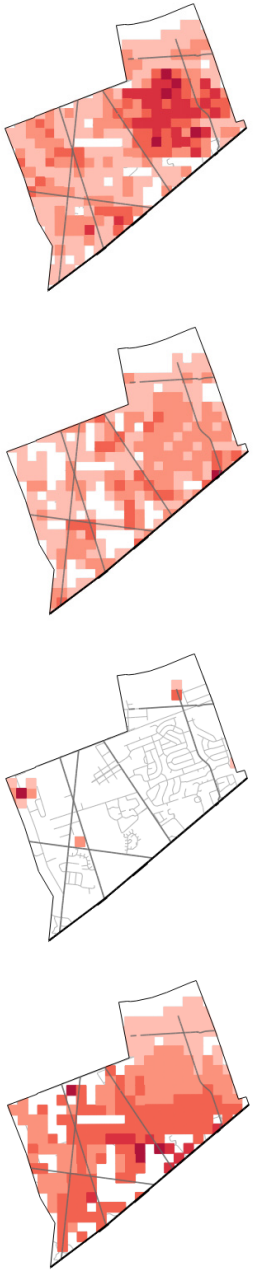


FIGURE 6.6.6: Heat exposure for four themes in Edgewater Park Township.



COMMUNITY RESOURCES

In Edgewater Park Township, 2% of residential buildings and 20% of public and commercial buildings have at least moderate-high heat exposure, concentrated in the south of the Township. Six public or commercial buildings have particularly high measured heat exposure. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat. While higher temperatures can also impact agricultural lands and reduce crop yields, these areas experience relatively lower temperature extremes than their more urbanized counterparts.

CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 86% of utility infrastructure, 25% of health and emergency services, 50% of hazardous material sites, and 18% of transportation routes in the Township have at least moderate-high heat exposure, concentrated mostly in the southern portion of the Township. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.

NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Edgewater Park Township, 85% of forests and shrublands and 94% of wetlands are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are in the northern portion of the Township.

SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and wellbeing. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the south of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.6.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.6.4: Distribution of heat exposure scores for land area and assets in Edgewater Park Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	1,868 Acres	72 (4%)	524 (28%)	1,014 (54%)	219 (12%)	40 (2%)
Community Resources						
Residential Buildings	2,150 Assets	34 (2%)	527 (25%)	1,550 (72%)	38 (2%)	1 (<1%)
Public & Commercial Buildings	254 (Assets	1 (<1%)	45 (18%)	157 (62%)	45 (18%)	6 (2%)
Agricultural Land	187 Acres	--	24 (13%)	133 (71%)	29 (15%)	1 (1%)
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	--	1 (14%)	4 (57%)	2 (29%)
Health & Emergency Services	4 Assets	--	--	3 (75%)	1 (25%)	--
Hazardous Material Sites	2 Assets	--	1 (50%)	--	1 (50%)	--
Transportation Routes	41 Miles	0.1 (<1%)	7 (18%)	26 (64%)	7 (16%)	1 (2%)
Evacuation Routes	3 Miles	--	0.1 (2%)	1.5 (48%)	1.5 (50%)	--
Natural Infrastructure						
Forests & Shrubland	172 Acres	23 (13%)	107 (62%)	38 (22%)	4 (2%)	--
Wetlands	4 Acres	--	4 (94%)	0.3 (6%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Edgewater Park has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Edgewater Park is along the northern and southern borders. Overall, 11% of the land area in the Township is considered exposed to landslides.

Figure 6.6.7 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.6.7: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.



FIGURE 6.6.8: Landslide exposure for four themes in Edgewater Park Township.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 9% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.21% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the west.

CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include one grocery store on US 130. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are US 130, Village Ct, and Spring Ln.

NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 23 acres, or 13%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure. No forests, shrublands, or wetlands have moderate to high exposure. These areas are mostly in the northeast.

SOCIAL FABRIC

Landslides can harm the homes and infrastructure that communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the south have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure are along the southern border.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.6.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.6.5: Distribution of landslide exposure scores for land area and assets in Edgewater Park Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	1,868 Acres	1,655 (89%)	128 (7%)	78 (4%)	6 (<1%)	--	--
Community Resources							
Residential Buildings	2,150 Assets	1,957 (91%)	135 (6%)	53 (2%)	5 (<1%)	--	--
Public & Commercial Buildings	254 (Assets	224 (88%)	10 (4%)	20 (8%)	--	--	--
Agricultural Land	187 Acres	177 (95%)	6 (3%)	4 (2%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	7 (100%)	--	--	--	--	--
Health & Emergency Services	4 Assets	3 (75%)	1 (25%)	--	--	--	--
Hazardous Material Sites	2 Assets	2 (100%)	--	--	--	--	--
Transportation Routes	41 Miles	35 (86%)	4 (11%)	1 (4%)	--	--	--
Evacuation Routes	3 Miles	2.4 (78%)	0.3 (11%)	0.3 (11%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	172 Acres	149 (87%)	12 (7%)	11 (7%)	--	--	--
Wetlands	4 Acres	4 (100%)	--	--	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Edgewater Park has an overall low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Edgewater Park is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if infrastructure in Edgewater Park is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Edgewater Park is highest in the northeast corner of the Township. These areas of relatively higher wildfire hazard potential have almost an equal amount of acreage of agricultural land and forests and shrubland. There is also a small amount of wetlands. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Across the Township, 1% of land area has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.6.9: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.

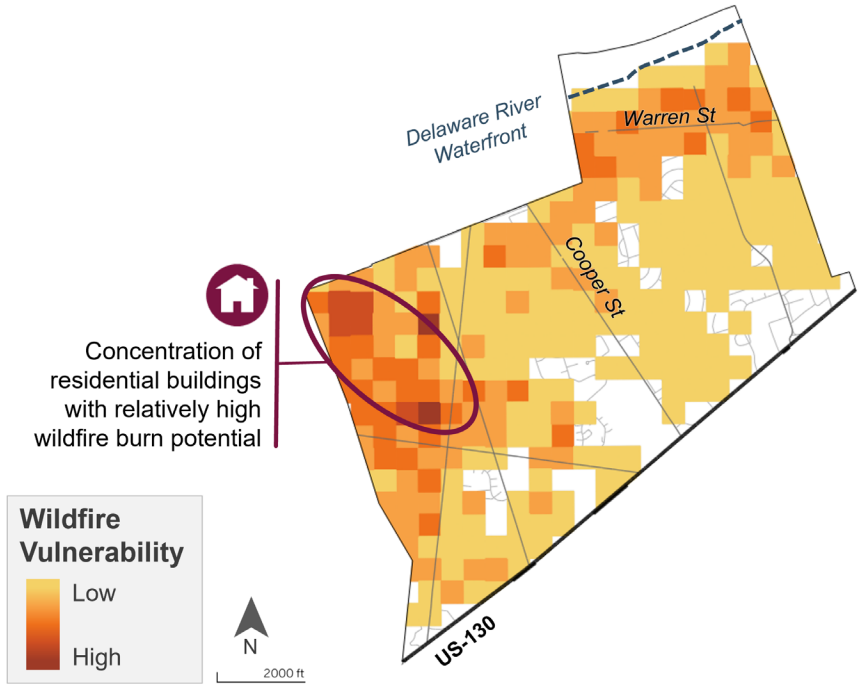


Figure 6.6.9 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.6.10: Wildfire exposure for four themes in Edgewater Park Township.



COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Edgewater Park are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure, such as along the western border of the Township. Areas with higher density urban development, meanwhile, have lower exposure. None of the buildings or agricultural lands in the Township has an annual likelihood of burning at or above 0.05%. Agricultural land is also most exposed when adjacent to naturalized areas, such as those found in the northeastern corner of the Township.

CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas. Roadways in more wildfire-prone areas include Perkins Ln, Delanco Rd, Marshall St, and Quail Dr. Although roads are less likely to be directly damaged by fire, they may serve as critical evacuation routes in the event of a wildfire.

NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands found to the west and wetlands in the northeast corner specifically along Perkins Ln have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.

SOCIAL FABRIC

If wildfires touch Edgewater Park communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Edgewater Park in the surrounding areas can still cause harm to Edgewater Park residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the northeast corner of the Township have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.6.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.6.6: Distribution of heat exposure scores for land area and assets in Edgewater Park Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	1,868 Acres	1,270 (68%)	168 (9%)	292 (16%)	138 (7%)	--	--
Community Resources							
Residential Buildings	2,150 Assets	1,743 (81%)	134 (6%)	194 (9%)	79 (4%)	--	--
Public & Commercial Buildings	254 (Assets	220 (87%)	14 (6%)	17 (7%)	3 (1%)	--	--
Agricultural Land	187 Acres	125 (67%)	8 (4%)	17 (9%)	38 (20%)	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	7 (100%)	--	--	--	--	--
Health & Emergency Services	4 Assets	4 (100%)	--	--	--	--	--
Hazardous Material Sites	2 Assets	2 (100%)	--	--	--	--	--
Transportation Routes	41 Miles	35 (86%)	1 (3%)	3 (8%)	1 (3%)	--	--
Evacuation Routes	3 Miles	2.9 (95%)	0.1 (5%)	--	--	--	--
Natural Infrastructure							
Forests & Shrubland	172 Acres	27 (15%)	51 (30%)	80 (46%)	15 (8%)	--	--
Wetlands	4 Acres	0.3 (6%)	0.2 (5%)	--	4 (88%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Edgewater Park Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Edgewater Park Township ranges from slightly drought-vulnerable to drought-vulnerable land. Nearly all of the land area in the Township (99%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Edgewater Park are spread throughout the whole Township.

Figure 6.6.11 shows the spatial distribution of drought vulnerability across the Township highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.6.11: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Edgewater Park Township.

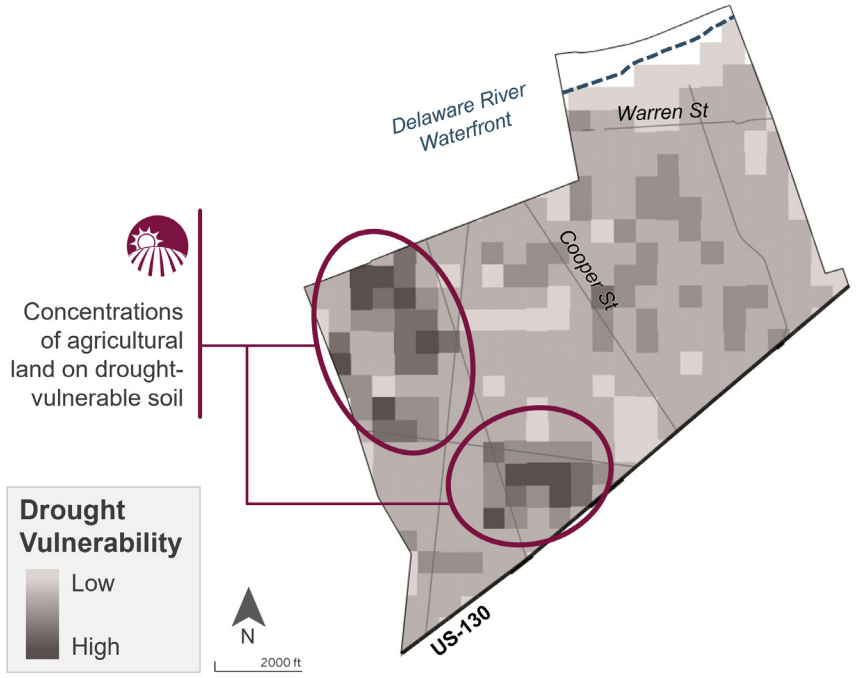


FIGURE 6.6.12: Drought exposure for four themes in Edgewater Park Township



COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. All agricultural land in the Township is on drought-vulnerable soil. Nearly all buildings (98%) are also on land modeled to be drought-vulnerable, spread throughout the Township. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.

CRITICAL INFRASTRUCTURE

All critical infrastructure assets in the Township are on drought-sensitive soil. 100% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.

NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Edgewater Park Township, 100% of wetlands and 99% of forests and shrublands are modeled to have drought-vulnerable soil.

SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the southwest have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Figure 6.4.11**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.6.7: Distribution of drought exposure scores for land area and assets in Edgewater Park Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	1,868 Acres	--	--	--	7 (<1%)	1,861 (99%)
Community Resources						
Residential Buildings	2,150 Assets	--	--	--	37 (2%)	2,113 (98%)
Public & Commercial Buildings	254 (Assets	--	--	--	1 (<1%)	253 (99%)
Agricultural Land	187 Acres	--	--	--	--	187 (100%)
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	--	--	--	7 (100%)
Health & Emergency Services	4 Assets	--	--	--	--	4 (100%)
Hazardous Material Sites	2 Assets	--	--	--	--	2 (100%)
Transportation Routes	41 Miles	--	--	--	0.4 (1%)	39 (99%)
Evacuation Routes	3 Miles	--	--	--	--	3 (100%)
Natural Infrastructure						
Forests & Shrubland	172 Acres	--	--	--	1 (1%)	171 (99%)
Wildlife Habitat Areas	4 Acres	--	--	--	--	4 (100%)
Wetlands	419 Acres	3 (1%)	122 (29%)	58 (14%)	54 (13%)	182 (43%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Edgewater Park has historically addressed environmental concerns within its planning documents, though the most recent and comprehensive climate change-related policy and planning document is its 2021 CCRHVA, included as part of the Township's Land Use Plan Element (discussed below). Climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1997 Master Plan Reexamination and 2000 Master Plan Update include a variety of objectives aimed at improving the Township's environmental integrity. These include goals such as preserving woodlands, enhancing parks and open spaces, and addressing environmental constraints in development, specifically encouraging redevelopment that respects existing densities and patterns.
- In 2002, the Township adopted its 2002 Open Space and Recreation Plan, which officially incorporates pivotal goals for the Township to guide the preservation of open space.
- The Edgewater Park Township Municipal Stormwater Management Plan was adopted in March 2005 to meet NJDEP regulatory standards. The plan addresses runoff quantity, water quality, and recharge through structural and non-structural best practices. It was revised in March 2007.
- Article 32, Floodplain Management, of Chapter 310, Land Development and Zoning, was amended on December 5, 2017, by Ordinance No. 2017-7 to reflect Edgewater Park Township's ongoing efforts to manage flood risk and guide safe development. The article regulates all activity within flood hazard areas to protect life, property, and the natural function of floodplains. It also establishes the role of the Township Floodplain Administrator, who is responsible for interpreting the ordinance and ensuring consistency with both local code and NJDEP regulations.
- The 2017 Master Plan Reexamination highlights a continued focus on improving pedestrian and bicycle access along key corridors like the Delaware River Heritage Trail and preserving open space through municipal acquisition.
- Edgewater Park's cornerstone of climate action planning is its 2021 CCRHVA, included as an Appendix to the 2021 Land Use Plan Element update. This document solidified the Township's commitment to proactive climate resilience strategies. The adoption of this assessment marked a shift from general environmental recommendations to specific, actionable plans focused on climate hazards, ensuring that the Township is prepared to adapt to changing climate conditions. Key actions within this assessment address environmental risks, particularly

those tied to flooding and land use changes. As part of the 2021 CCRHVA, a buildout analysis was conducted and it was determined that although the Township is predominantly built out, it can accommodate additional residential and non-residential development. The 2021 CCRHVA evaluates the impact on the Master Plan, provides strategies and design standards, and provides a policy statement. Through this formalized plan, Edgewater Park has made clear its intention to integrate climate change considerations more deeply into all future planning processes.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Edgewater Park has a high hazard rating for severe weather and severe winter weather; medium ratings for disease outbreak, drought, extreme temperatures, and flood; and low ratings for dam failure, earthquake, and wildfire. The Township demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, severe winter weather, and wildfires, and a moderate capacity in dealing with dam failures, droughts, earthquakes, floods, and severe weather.

STATE EFFORTS

- NJDEP's 2014 CVI found that there are minimal higher-risk and moderate-risk areas within the Township, with small concentrations along the Delaware River and around Bog's Ditch. There are no critical facilities in the municipality that are located in moderate- or higher-risk areas.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Edgewater Park Township includes a full spectrum of residential, commercial, and industrial zoning districts, with minimum lot sizes ranging from 2,500 square feet in the R-8 zone to over 217,800 square feet (or 5 acres) in the R-MF Multifamily Residential district. Residential zoning ranges from compact single-family to multifamily inclusionary, senior living, and age-restricted developments. Commercial zones span neighborhood retail to highway-oriented and light industrial hybrids. Industrial zones carry higher minimum lot sizes, typically aligned with regional manufacturing or distribution uses. **Table 6.6.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as multifamily residential developments, planned age-restricted developments, and inclusionary zoning overlays, the amount of land available for new development can be computed. Edgewater Park Township contains 2,828 parcels and/or land masses across all zoning districts, which do not face those restrictions above, and has an estimated 58,000,000 square feet (or approximately 1,333 acres) of unconstrained land capable of a complete buildout. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating the buildout capacity using the zones' minimum lot area requirements.

TABLE 6.6.8: Edgewater Park Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-8 (Single-Family and Multifamily Residential Inclusionary)	2,500 square feet
R-4 (Single-Family Residential)	7,500 square feet
R-5 (Single-Family Residential)	12,500 square feet
R-3 (Single-Family Residential)	20,000 square feet
R-2 (Single-Family Residential)	40,000 square feet
R-1 (Single-Family Residential)	85,000 square feet
R-7 (Residential Low-Density)	32,000 square feet
R-MF (Multifamily Residential)	217,800 square feet
R-TH/MF (Townhouse/Multifamily Inclusionary Residential)	217,800 square feet
R-AR (Age-Restricted Residential)	1,524,600 square feet
R-AR-1 (Age-Restricted Residential)	1,306,800 square feet
R-LD (Low-Density Single-Family Residential)	Not included in buildout
R-6 (Single-Family Residential)	Not included in buildout
SAH (Senior Affordable Housing Overlay)	Not included in buildout
Commercial Zones' Minimum Lot Areas	
C-1 (Neighborhood Commercial)	Not present in dataset
C-2 (Downtown Commercial)	20,000 square feet
C-3 (Highway Commercial)	87,120 square feet
Industrial Zones' Minimum Lot Areas	
C-LI-1 (Commercial-Light Industrial)	43,560 square feet
C-LI-5 (Commercial-Light Industrial)	217,800 square feet
LI (Light Industrial)	87,120 square feet
I (General Industrial)	87,120 square feet
Special or Excluded Zones	
C (Cemetery)	Not included in buildout
SAH (Senior Affordable Housing Overlay)	Not evaluated in standard methodology

TABLE 6.6.9: Edgewater Park Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
C-2	19	451,043.11	10.35	20,000	22.55
C-3	11	1,342,520.85	30.82	87,120	15.41
C-3	9	1,215,974.30	27.91	87,120	13.96
C-3	18	1,247,640.29	28.64	87,120	14.32
C-LI-1	5	311,499.01	7.15	43,560	7.15
C-LI-1	2	167,857.07	3.85	43,560	3.85
C-LI-1	12	605,929.38	13.91	43,560	13.91
C-LI-5	15	5,843,282.62	134.14	217,800	26.83
I	13	1,883,979.39	43.25	87,120	21.63
LI	10	833,189.60	19.13	87,120	9.56
R-1	70	4,243,473.85	97.42	85,000	49.92
R-2	57	1,056,458.96	24.25	40,000	26.41
R-2	219	10,594,021.41	243.21	40,000	264.85
R-2	55	1,126,144.08	25.85	40,000	28.15
R-3	18	505,411.27	11.6	20,000	25.27
R-3	56	1,928,581.38	44.27	20,000	96.43
R-3	1	44,793.29	1.03	20,000	2.24
R-4	1,115	11,701,966.89	268.64	7,500	1560.26
R-5	34	321,382.15	7.38	12,000	26.78
R-5	128	2,818,732.11	64.71	12,000	234.89
R-5	6	154,912.89	3.56	12,000	12.91
R-7	3	2,780,835.49	63.84	32,000	86.9
R-8	1	395,090.65	9.07	2,500	158.04

* *Maximum buildout hypothetical*

Edgewater Park Township's buildout analysis identifies the R-4 zone as having the greatest remaining development capacity, as shown in **Table 6.6.9**. Under current zoning, approximately 1,560.26 new lots are possible within the district. The R-4 zone reflects a conventionally developed residential pattern, and this projection suggests that many existing parcels exceed the minimum lot size requirement, contributing to the buildout potential. This analysis should be interpreted cautiously and viewed as a zoning-based theoretical exercise rather than a realistic forecast of future development.

Most nonresidential districts in the Township are effectively built out. The "LI" Light Industrial district contains ten existing lots and has capacity for 9.5 lots, indicating accurate utilization. The C-2 commercial district, with 19 existing lots and a theoretical capacity of 22.5, similarly shows limited future development potential.

The R-MF and R-TH/MF multifamily and townhouse districts were developed in response to affordable housing concerns and are not conducive to a standard buildout analysis since they were designed to address a specific need. The age-restricted districts of R-AR and R-AR-1 also appear to have been developed in response to affordable housing concerns, which are not conducive to a standard buildout analysis since they were designed to address a specific need. In addition, the R-4 District (Single-Family and Multifamily Residential Inclusionary District) was also developed in response to affordable housing concerns and is not conducive to a standard buildout analysis since it was designed to address a specific need in a predominantly built-out area. As such, these areas have been excluded.

Overall, Edgewater Park Township can be classified as effectively built out, with the total number of existing lots exceeding calculated zoning capacity by approximately 113.8 lots. The R-4 district's remaining development potential plays a key role in considering where the land base, under consolidation and re-subdivision, can potentially see an increase in density over time.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The city has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Township is working towards the redevelopment for the Former Pathmark Property, located at Cooper St and Route 130. There is a redevelopment agreement for this property, which is now referred to as "Edgewater Park Urban Renewal Entity, LLC." This agreement consists of three phases.

- Phase I is the reconstruction/re-pavement of the current parking lot and improvements to the existing building façade.
- Phase II is the proposed construction of additional retail spaces with the site.
- Phase III designates a vacant portion of the site, which is intended to be sold to Spark to construct a car wash. The Township Committee and the Zoning/Planning boards are working to amend the current Redevelopment Zone to include "car washes" as they are not currently recognized uses in that zone.

ROUND IV OF AFFORDABLE HOUSING

On January 21, 2025, Edgewater Park Council adopted Resolution 2025-29 accepting the DCA calculation of the estimated Round IV obligations. May 15, 2025, the Edgewater Park Township Planning Board, through Resolution No. P-10-2025, adopted the Round IV Housing Element and Fair Share Plan with a present need obligation of 72 units, and the prospective need obligation is 59 units. Edgewater Park will address its 72-unit Rehabilitation Share through continued participation in Burlington County's Home Improvement Loan Program and by continuing its participation in a local rehabilitation program established in November 2017.

The Township proposes to address its Round IV prospective need obligation with a completed inclusionary development, one development under construction, an approved mixed-use inclusionary development, an alternative living arrangement facility under renovation, an approved 100% affordable housing senior/supportive housing development, and Round IV bonuses. All of the Round 4 projects are free of any environmentally sensitive areas, such as wetlands, flood hazard areas, or steep slopes. Several residential development projects are underway or planned, contributing to the municipality's affordable housing stock through a mix of senior, supportive, and family housing units.

The Mount Holly Rd (Walters Group Block 502 Lot 11) project involves the new construction of 58 senior and supportive housing units. Of these, 13 are affordable units, with an additional 13 units qualifying as bonus credits, resulting in a total of 26 credited affordable units. The Ariel Mixed Use project (Block 1202.11 Lot 21), developed by Rt 130 S, LLC, received a use variance approval in April 2023 to modify a previously approved retail development. The revised plan includes a four-story mixed-use building with commercial uses on the ground floor and 45 non-age-restricted residential apartments above. The project includes seven affordable units and 38 market-rate units. The Varsaci Tract (Block 404.06, Lot 1) on Mount Holly Rd is expected to yield 80 residential units under proposed zoning changes. Depending on whether the units are for sale or rental, the development will include either 16 for-sale affordable units (at a 20% set-aside) or 12 rental affordable units (at a 15% set-aside), with the remainder market-rate housing. The Fox Run development by Ryan Homes provides 20 affordable family housing units for sale. Of these, 19 are credited under the prior round obligation, with one

unit allocated to Round 4. Oaks Integrated is developing supportive and special needs housing on Perkins Ln. This project includes 4 affordable units and qualifies for one bonus unit, totaling 5 credited affordable units. Lastly, the Eagle Chase/ Abergel project (Block 1202 Lots 1.10 & 9) offers affordable family rental housing, contributing a total of 24 units—20 from a prior round and four new units credited toward Round 4.

Resilience Strategy

Edgewater Park Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

Edgewater Park developed its first CCRHVA in 2021. A policy statement was developed in this CCRHVA to comply with MLUL requirements. For consistency, this CCRHVA utilizes the municipality's previous statement.

> Edgewater Park will promote smart growth by continuing to implement sound planning practices, which balance development with land conservation and environmental stewardship. The Township will promote environmental sustainability and safeguard environmental infrastructure by adopting water conservation, floodplain, wellhead protection, stormwater, and stream corridor protection ordinances consistent with the New Jersey Department of Environmental Protection. The Township will preserve and protect its limited natural habitat, wetlands, and flood-prone areas that are concentrated along the Delaware River.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

Edgewater Park received $1,015,000 in federal funding to build a Pump Station Facility at the Silver Park West Retention Pond to remediate frequent flooding at a senior development. This funding will expand the stormwater infrastructure by constructing a discharge line and automated pump station with a backup generator. The grant will go a long way to correcting the flooding at the senior development.

EDGEWATER PARK TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.6.13: View of the Edgewater Park Township Municipal Building. *(Source: Mr. Matté, Wikimedia Commons, CC BY-SA 4.0)*



EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

Drainage Improvements at Bogg's Run

The creek near the border of Delanco Township backs up with sediment and trees, in the same location where the water should be discharged, and floods homes on the Edgewater Park side, off Perkins Ln. There is also a culvert beneath the light rail in this area, which is undersized. There is a need to implement improvements to increase the capacity of culverts at the Light Rail Line and Burlington Ave to mitigate flooding issues.

RESPONSIBLE PARTY	Edgewater Park Township OEM in coordination with Delanco Township OEM, Burlington County OEM, NJ Transit, USACE
ESTIMATED COSTS	To be determined
POSSIBLE SOURCE(S) OF FUNDING	To be determined



ESTIMATED TIMELINE

0-5 years

PRIORITY RATING

★★★★★

High

EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

Adams Ave Basins Consolidation, Pump Station, and Generator

There are two basins divided by a dirt pathway that goes out to the pump station. However, there is a need to expand capacity of the pond, so the middle embankment (pathway) will need to be removed. The project would also include relocating the pump and adding a new walking area for access. A new automated pump station will then be constructed with a backup generator.

RESPONSIBLE PARTY	Edgewater Park Township OEM, Burlington County OEM
ESTIMATED COSTS	$400K - $700K
POSSIBLE SOURCE(S) OF FUNDING	Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

Multi-Municipal Flood Resilience Coordination

Establish a collaborative framework along neighboring municipalities to coordinate flood mitigation, preparedness, and response efforts. This initiative can facilitate data sharing, align stormwater infrastructure projects, and develop joint initiatives for flood events. Regular inter-municipal meetings can help with consistent communication, reduce redundancy, and strengthen resilience efforts.

RESPONSIBLE PARTY	Edgewater Park Township, Beverly City, Delanco Township
ESTIMATED COSTS	$0 - $50K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

Medium

EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

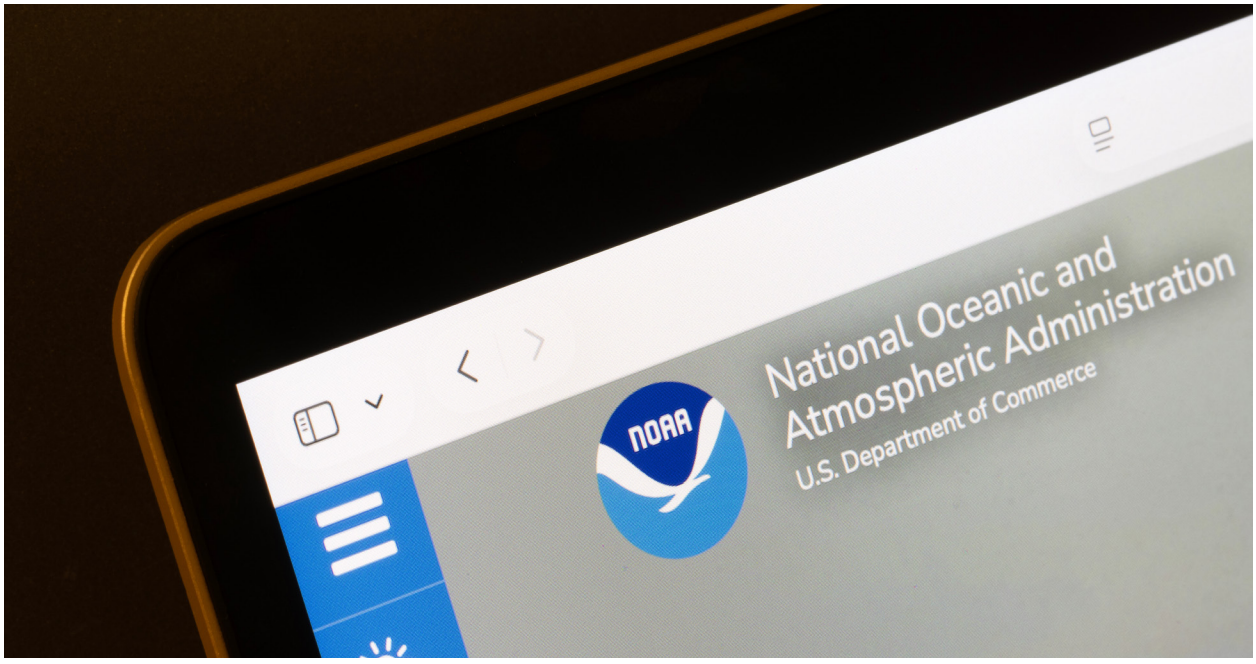
Participate in NOAA's StormReady Program

The StormReady program helps arm America's communities with the communication and safety skills needed to save lives and property—before, during and after the event. StormReady helps community leaders and emergency managers strengthen local safety programs. Edgewater Park will apply to and participate in the program to strengthen community preparedness. Through this initiative, the Township will enhance communication systems, improve emergency response planning, and promote public education on safety during severe weather events.

RESPONSIBLE PARTY Edgewater Park Township

ESTIMATED COSTS $0K - $50K

POSSIBLE SOURCE(S) OF FUNDING Capital Funds



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

Medium



EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

Educate Residents on Disease Outbreaks

Edgewater Park will identify and engage qualified public health professionals, educators, and community partners to help inform and educate residents on how to prepare for and respond to disease outbreaks. This effort will focus on improving community awareness, promoting preventative measures, and strengthening local capacity to manage future public health emergencies.

RESPONSIBLE PARTY	Edgewater Park Township OEM
ESTIMATED COSTS	$0K - $150K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★ ☆ ☆ ☆ ☆

Low

EDGEWATER PARK TOWNSHIP RESILIENCE ACTION

Community Center Emergency Services Planning Initiative

Edgewater Park will begin conducting meetings to plan and coordinate the use of the new Community Center as a hub for emergency services. The Township will explore how the facility can serve multiple resilience functions, including operating as a community nutrition site, providing meals to residents, and serving as an overflow location during Code Blue events. These discussions will also identify additional emergency management and community support services that can be provided at the site to enhance overall preparedness.

RESPONSIBLE PARTY Edgewater Park Township

ESTIMATED COSTS $0K - $150K

POSSIBLE SOURCE(S) OF FUNDING Capital Funds



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Low



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

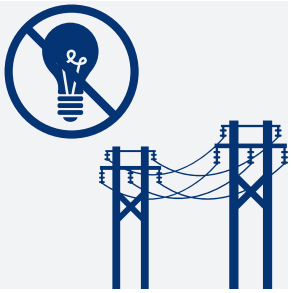


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



Like many of the River Communities, we experience damage due to heavy rain events and the subsequent flooding that comes with it. Since much of our infrastructure was designed 50-70 years ago, and the guidelines for controlling stormwater were so much lower, we realize the capacity for managing it is now inadequate.

The guidelines which were incorporated during that time may have been worst case scenario – a (50) year storm. Today, we are planning for and experiencing (two hundred) year storms.

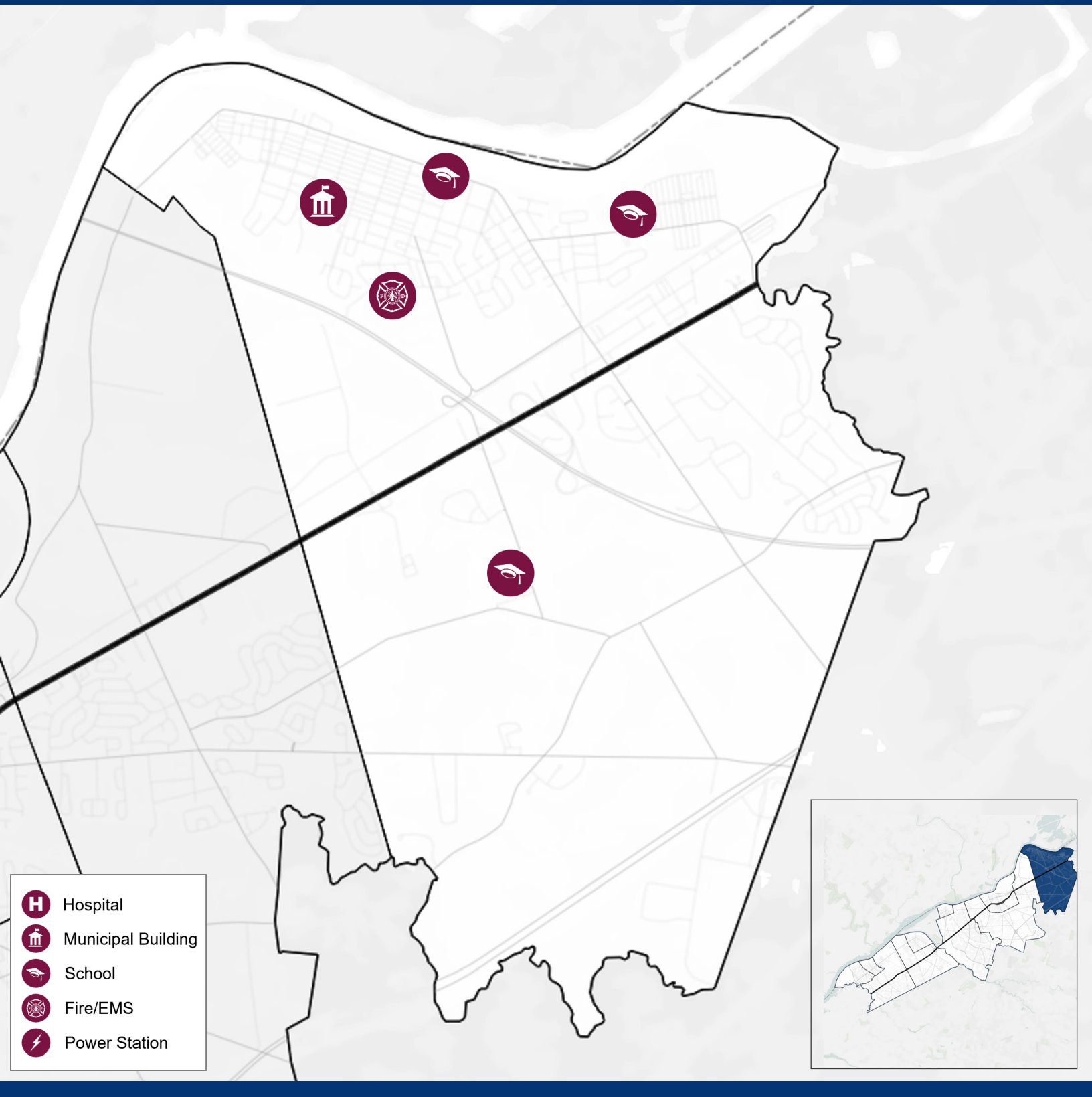
As we continue to develop, particularly residential, we are mindful of this and the sizes of our retention ponds along with pipe needed to carry water need to be adequate to handle such storms. Even though we cannot dictate Traffic onto our major highway (Route 130), because it is controlled by County and/or State DOT, we are still mindful of its impact on ground transportation and do all we can to restrict water flows in these areas. To that end, we need to connect and have conversations with both entities and try to collectively devise a solution.

Overall, our mindset is to examine those areas susceptible to flooding and do everything possible to correct the conditions.

– Edgewater Park Township



SECTION 6.7: Florence Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Florence Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: While Florence Township is not as widely exposed to flooding as other hazards, it can still be a source of direct and indirect risk for assets and residents alike. The majority of flood exposure can be found in the north along the Delaware River, in the center of the Township around Bustleton Creek, and in the northeast along Crafts Creek.



Sea Level Rise: Sea level rise is a small but potentially growing concern for Florence. The overall extent of sea level rise hazard exposure is very minimal, with most areas not impacted by sea level rise, but tidal inundation driven by sea level rise is concentrated in the northern and northeastern portion of the Township along the Delaware River.



Heat: Florence Township has an overall higher risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Township can be found in the north, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Florence has an overall moderate risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Florence is in the center and the east of the Township.



Wildfire: Florence has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. Wildfire potential is highest in the southern region of the Township, with additional select areas of higher wildfire potential in the northeastern portion of the Township as well.



Drought: Florence Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Florence Township ranges from slightly drought vulnerable to drought vulnerable land.

Resilience actions were developed to address risks identified in Florence Township's vulnerability assessment, and include:

- Riverbank Stabilization
- Expand Tree Canopy
- Erosion Control Policy
- Public Outreach and Enforcement to Prevent Dumping
- Update Zoning to Support Lower Density and Green Space Preservation
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Located along the Delaware River in the northern portion of the Route 130 Corridor, Florence Township (the Township) contains a population of 12,798 people. The Township contains primarily residential land uses fronting the Delaware River and industrial, warehousing, and office uses along the New Jersey Turnpike Extension and Route 130. The southern portion of the Township contains sparse and lower-density residential uses, wetland areas, and agricultural uses. The Township is connected to the NJ Transit-operated River LINE light rail and contains the Roebling Museum which celebrates the Township's history as a former steel town. **Table 6.7.1** shows socially vulnerable populations in Florence Township. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.7.1: Socially vulnerable populations in Florence Township.

DEMOGRAPHIC VARIABLE	FLORENCE TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	12,798	--	9,267,014	--
Total Household Units	5,007	--	3,775,842	--
Occupied Housing Units	4,837	--	3,478,355	--
Vacant Housing Units	170	--	297,487	--
Population 18 or Younger	3,455	**27.00%**	2,031,322	21.90%
Population 65 or Older	2,219	**17.34%**	1,559,816	16.83%
Population with a disability	1,373	**10.70%**	975,308	10.60%
Persons without a high school diploma	770	8.91%	600,736	9.30%
Persons below poverty level	2,148	**17.08%**	1,415,719	15.56%

DEMOGRAPHIC VARIABLE	FLORENCE TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Civilians (age 16+) unemployed	N/A*	5.10%	N/A*	6.20%
Persons uninsured	485	3.80%	682,266	7.40%
Persons who speak English "less than well"	222	1.90%	562,865	6.44%
Single Parent households	446	**9.22%**	198,943	5.72%
Minority Ethnicity (non-white)	4,587	35.84%	4,453,673	48.06%
Mobile homes	18	0.40%	35,303	0.90%
Housing with 10 or more units	180	3.59%	639,960	16.95%
Crowded housing units	137	2.83%	129,710	3.73%
Households with no vehicle	182	3.80%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

In 2022, Florence adopted a CCRHVA as part of its Master Plan Land Use Element update. This CCRHVA recognizes the previous work, and builds upon the previous findings. In this CCRHVA, new data is used to assess hazards and more hazards are examined. More recent planning documents are reviewed in the Plan Alignment section. This provides new resilience actions the Township can take. This document develops a buildout analysis for the Township. Finally, this document updates both the vulnerability assessment and the policy statement based on elected, staff and public feedback.

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Townships of Burlington and Florence, and Burlington City took place on April 10th, 2025, from 5:15 to 6:45 p.m. Approximately 30 stakeholders attended the meeting, with three from Florence Township.

Attendees from Florence Township were primarily concerned with the potential for more frequent and severe rainstorms and the infrastructure capacity to withstand

these events, in addition to a general lack of disaster preparedness and planning at the municipal level. When asked about climate concerns and hazards observed in their community, attendees affiliated with Florence Township indicated that they are fearful of flooding on streets and low-lying grounds. Problem areas identified were primarily impervious surfaces, particularly around industrial sites and warehouses, due to their high flood vulnerability. Respondents reported the riverfront is a highly valuable community asset, as it is a place of community gathering. Roads were also identified as a significant economic asset to the community. Resilience, to attendees from Florence Township, means having the ability, as a community, to prepare for and withstand climate change-related impacts and events through enhancements to municipal systems, particularly those interventions focused on flood prevention.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

One attendee was from Florence Township. Poll results indicated critical infrastructure as an asset that is important to address. Other feedback related to Florence Township expressed concern for erosion and learning that landslides are a hazard in this area.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Burlington City, Burlington Township, and Florence in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Florence.

Feedback from Florence Township included the Township's concern over flooding on County roads.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed. The draft policy statements were also reviewed. Florence Township officials noted again that flooding is not a large issue for the Township, and they have already taken some actions, such as moving their pump station and buying out properties that flood. However, the officials noted, heat is a pressing climate change-related issue. Officials also indicated that they would be interested in a resilience action relating to the County's maintenance of County roads.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Potential regional actions (continuation of road maintenance, explanation of NJDEP's Blue Acres program, and stream clearing, bank stabilization, and channel restoration) were discussed. Florence representatives noted that there are areas in need of continuation of road maintenance. In addition, the Township's entire river frontage (about 12 blocks) is in need of bank stabilization. Potential resilience actions discussed were riverbank stabilization, communication on illegal dumping, flooding along Route 130, and increasing tree canopy to address heat impacts.

Map and Survey Comments

The Project Team received one comment for Florence Township, noting riverbank erosion.

> **"Within the last 3-5 years, the erosion along the riverbank has been problematic. The erosion is washing away the bottom of the riverbank and slowly lowering the height of the bank and exposing tree roots along the top of the bank."**
>
> *– Florence Township Resident*

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

Flooding

While Florence Township is not as widely exposed to flooding as other hazards, it can still be a source of direct and indirect risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Florence Township is in the northern area of the Township along the Delaware River, in the center of the Township around Bustleton Creek, and in the northeast along Crafts Creek. These areas represent 9% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Township (85%) is not within a modeled floodplain used in this analysis.

Figure 6.7.1 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.7.1: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

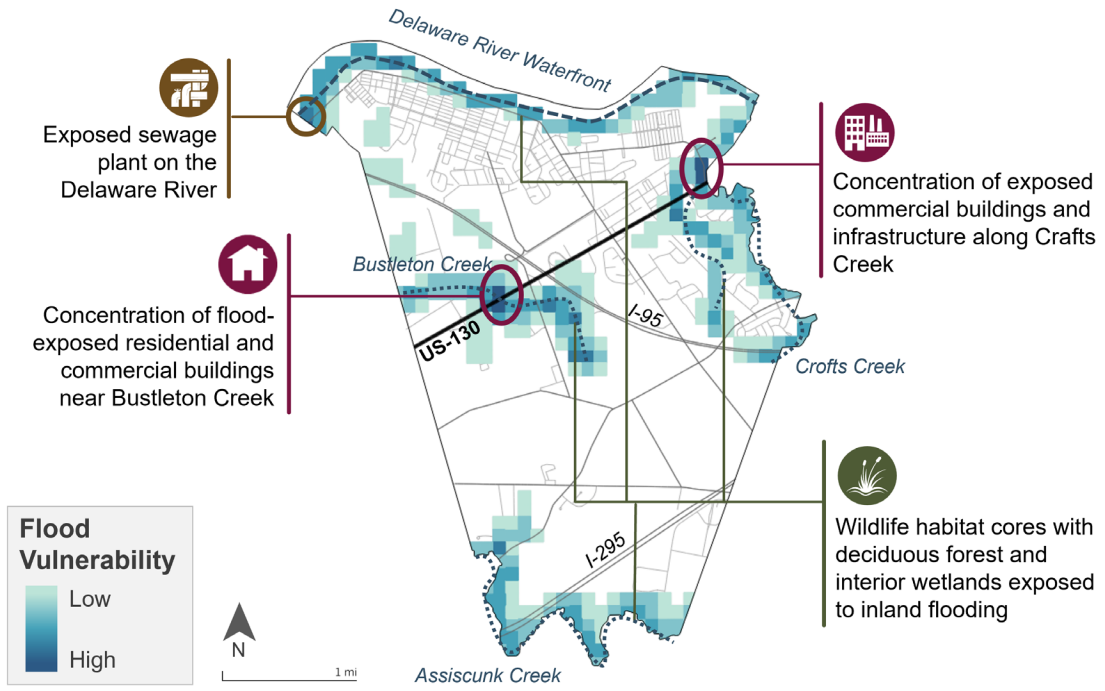
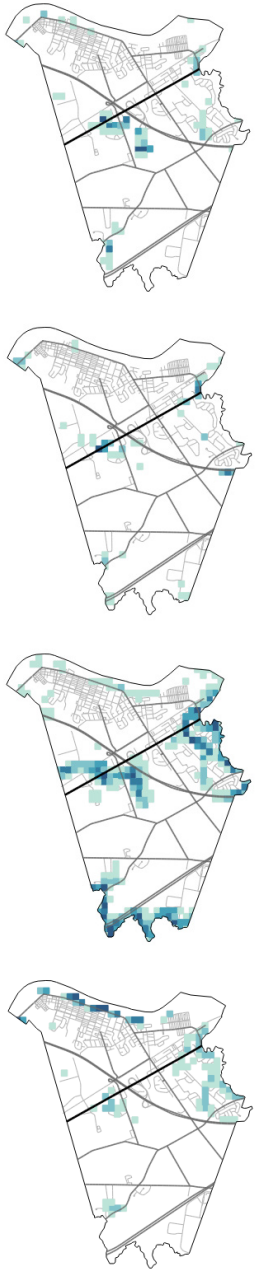


FIGURE 6.7.2: Flood exposure for four themes in Florence Township.



COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Florence Township, none of the 3,394 residential buildings in the Township are classified as having high flood exposure (within a 1% annual chance floodplain today), and only 16, or 3%, of the 511 public and commercial buildings have high exposure, with a concentration along Crafts Creek in the northeast. Seventeen acres of agricultural land in the Township are also considered to have high flood exposure, mostly concentrated in the central area of the Township.

CRITICAL INFRASTRUCTURE

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Florence Township, none of the 3,394 residential buildings in the Township are classified as having high flood exposure (within a 1% annual chance floodplain today), and only 16, or 3%, of the 511 public and commercial buildings have high exposure, with a concentration along Crafts Creek in the northeast. Seventeen acres of agricultural land in the Township are also considered to have high flood exposure, mostly concentrated in the central area of the Township.

NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Florence Township, 168 acres, or 22%, of forests and shrublands in the Township are exposed to high levels of flooding, concentrated in the northeast around Crafts Creek and in the south along Assiscunk Creek. Similarly, 16% of wildlife habitat areas and 27% of wetlands are also within high flood exposure areas in the same concentrated areas, but wetlands are more resilient to flooding effects than other asset types.

SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the north have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River, Assiscunk Creek, Bustleton Creek, and Crafts Creek, may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.7.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.7.2: Distribution of flood exposure scores for land area and assets in Florence Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	6,202 Acres	5,274 (85%)	318 (5%)	47 (1%)	563 (9%)
Community Resources					
Residential Buildings	3,394 Assets	3,369 (99%)	25 (1%)	--	--
Public & Commercial Buildings	511 Assets	470 (92%)	19 (4%)	6 (1%)	16 (3%)
Agricultural Land	1,260 Acres	1,211 (96%)	32 (3%)	--	17 (1%)
Preserved Farmland	326 Acres	321 (98%)	5 (2%)	--	--
Critical Infrastructure					
Utility Infrastructure	39 Assets	29 (74%)	3 (8%)	3 (8%)	4 (10%)
Health & Emergency Services	3 Assets	3 (100%)	--	--	--
Hazardous Material Sites	10 Assets	9 (90%)	--	--	1 (10%)
Transportation Routes	99 Miles	95 (96%)	2 (2%)	0.4 (<1%)	2 (2%)
Evacuation Routes	15 Miles	13 (89%)	0.5 (3%)	0.2 (1%)	0.9 (6%)
Natural Infrastructure					
Forests & Shrubland	766 Acres	537 (70%)	56 (7%)	4 (1%)	168 (22%)
Wildlife Habitat Areas	3,142 Acres	2,473 (79%)	174 (6%)	6 (<1%)	489 (16%)
Wetlands	761 Acres	525 (69%)	34 (4%)	--	203 (27%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a small but potentially growing concern for Florence. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware, Assiscunk Creek, Crafts Creek, and Bustleton Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the northern and northeastern portion of the Township along the Delaware River. Across the Township, 103 acres, or 2%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is very minimal, with most areas not impacted by sea level rise. Around the end of the century, 4% of the land area in the Township may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.7.3 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.7.3: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

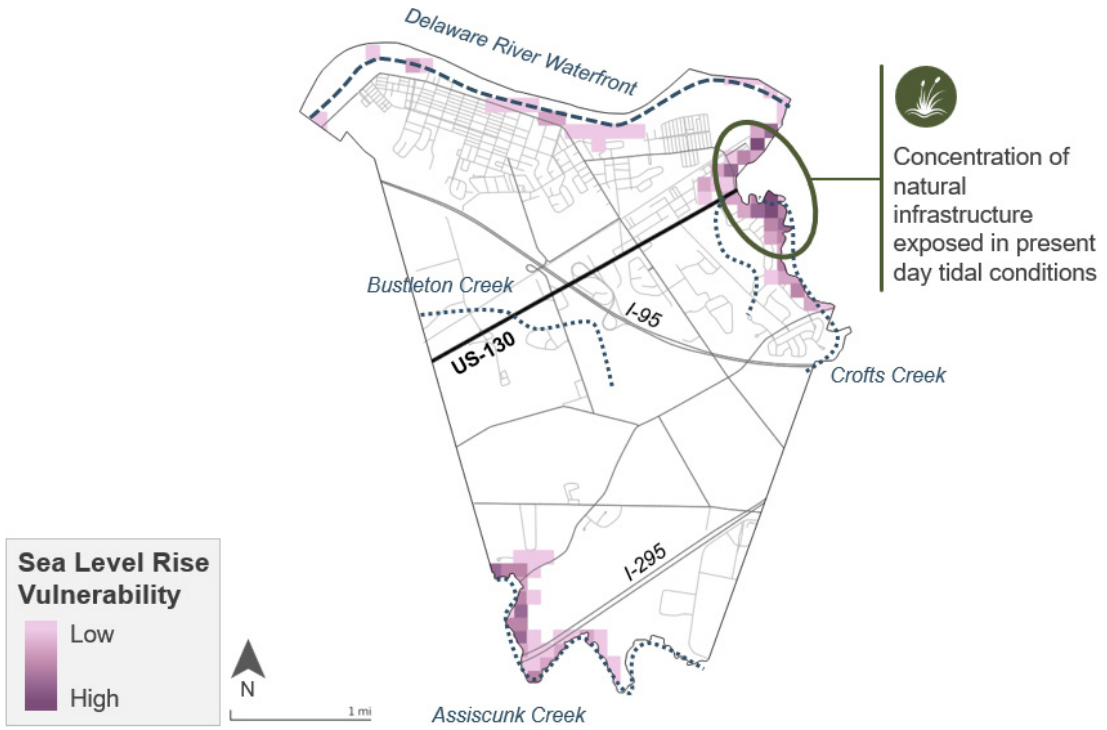


FIGURE 6.7.4: Sea level rise exposure for four themes in Florence Township.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Florence, no homes or public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and only one building in the southwest portion of the Township would be exposed at five feet. Additionally, only one acre of agricultural land, localized in the southeast, is exposed to tidal inundation at five feet of sea level rise.

CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Florence, no critical infrastructure assets and only 0.1 miles of roadway are exposed to 4-5 feet of tidal inundation.

NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. 82 acres, representing 11% of wetlands in the Township, are exposed to 4-5 feet of tidal inundation, concentrated in the southwest and northeast as they line the Assiscunk Creek and the Crafts Creek, respectively. Similarly, 9% of forests and shrublands and 6% of wildlife habitat areas are exposed under the same conditions.

SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in north and southwest which line the Delaware River and Assiscunk Creek, respectively, have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.7.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed. .

TABLE 6.7.3: Distribution of sea level rise exposure scores for land area and assets in Florence Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	6,202 Acres	5,982 (96%)	22 (<1%)	31 (<1%)	21 (<1%)	27 (<1%)	16 (<1%)	103 (2%)
Community Resources								
Residential Buildings	3,394 Assets	3,394 (100%)	--	--	--	--	--	--
Public & Commercial Buildings	511 Assets	510 (100%)	1 (<1%)	--	--	--	--	--
Agricultural Land	1,260 Acres	1259 (100%)	1 (<1%)	--	--	--	--	--
Preserved Farmland	326 Acres	326 (100%)	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	39 Assets	39 (100%)	--	--	--	--	--	--
Health & Emergency Services	3 Assets	3 (100%)	--	--	--	--	--	--
Hazardous Material Sites	10 Assets	10 (100%)	--	--	--	--	--	--
Transportation Routes	99 Miles	99 (100%)	0.1 (<1%)	--	--	--	--	--
Evacuation Routes	15 Miles	15 (100%)	--	--	--	--	--	--
Natural Infrastructure								
Forests & Shrubland	766 Acres	699 (91%)	5.5 (1%)	11.1 (1%)	5.1 (1%)	9.2 (1%)	5.2 (1%)	30.7 (4%)
Wildlife Habitat Areas	3,142 Acres	2,958 (94%)	20 (1%)	27 (1%)	26 (1%)	27 (1%)	19 (1%)	64 (2%)
Wetlands	761 Acres	679 (89%)	10 (1%)	16 (2%)	12 (2%)	13 (2%)	10 (1%)	22 (3%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Florence Township has an overall higher risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township can be found in the north. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 3% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 43% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.7.5 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.7.5: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

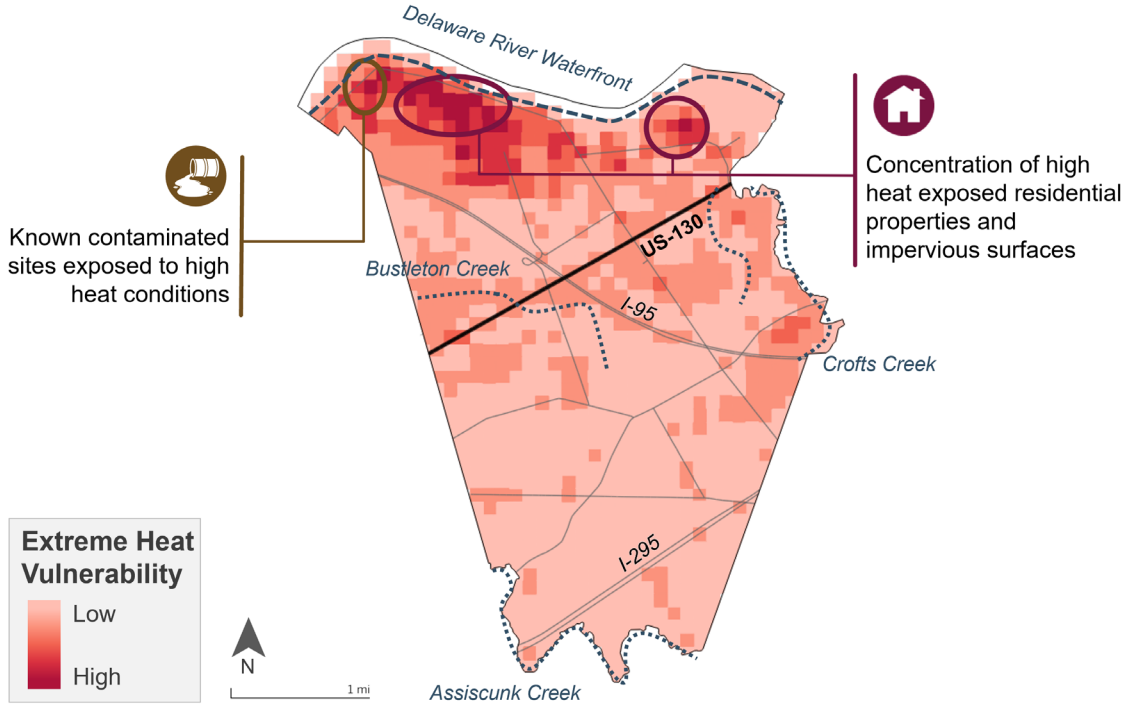
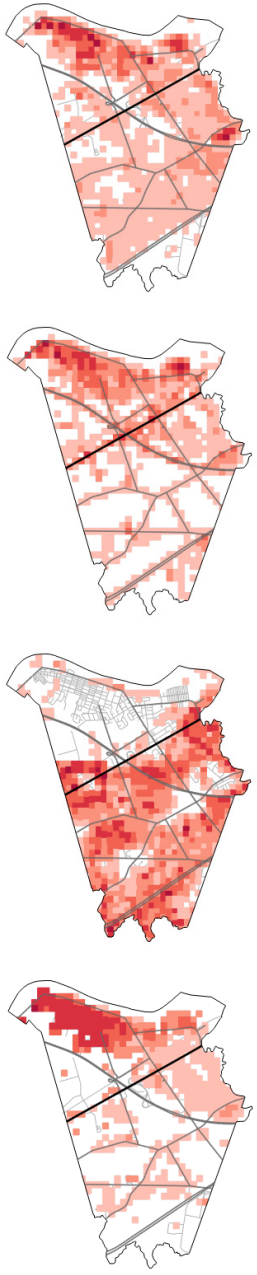


FIGURE 6.7.6: Heat exposure for four themes in Florence Township.



COMMUNITY RESOURCES

In Florence Township, 4% of public and commercial buildings have at least moderate-high heat exposure, all of which are in the northwest. Three public or commercial buildings have particularly high measured heat exposure, including Florence Township Memorial High School. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat. While higher temperatures can also impact agricultural lands and reduce crop yields, these areas experience relatively lower temperature extremes than their more urbanized counterparts.

CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 5% of utility infrastructure, 20% of hazardous material sites, and 1% of transportation routes in the Township have at least moderate-high heat exposure, concentrated in the northwest. While many critical infrastructure assets are designed not to be impaired by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.

NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Florence Township, 94% of forests and shrublands, nearly 100% of wetlands, and 95% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are concentrated in the south of the Township.

SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the north of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.7.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.7.4: Distribution of heat exposure scores for land area and assets in Florence Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	6,202 Acres	2,687 (43%)	2,200 (35%)	1,115 (18%)	81 (1%)	119 (2%)
Community Resources						
Residential Buildings	3,394 Assets	327 (10%)	1,693 (50%)	1,374 (40%)	--	--
Public & Commercial Buildings	511 Assets	90 (18%)	179 (35%)	230 (45%)	9 (2%)	3 (1%)
Agricultural Land	1,260 Acres	847 (67%)	405 (32%)	9 (1%)	--	--
Preserved Farmland	326 Acres	262 (80%)	64 (20%)	--	--	--
Critical Infrastructure						
Utility Infrastructure	39 Assets	4 (10%)	10 (26%)	23 (59%)	2 (5%)	--
Health & Emergency Services	3 Assets	--	1 (33%)	2 (67%)	--	--
Hazardous Material Sites	10 Assets	--	5 (50%)	3 (30%)	2 (20%)	--
Transportation Routes	99 Miles	10 (10%)	49 (50%)	39 (50%)	1 (1%)	0.1 (<1%)
Evacuation Routes	15 Miles	0.4 (3%)	11.4 (77%)	3 (20%)	--	--
Natural Infrastructure						
Forests & Shrubland	766 Acres	544 (71%)	179 (23%)	29 (4%)	5 (1%)	8 (1%)
Wildlife Habitat Areas	3,142 Acres	2,213 (70%)	788 (25%)	136 (4%)	3 (<1%)	2 (<1%)
Wetlands	761 Acres	716 (94%)	45 (6%)	0.4 (<1%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Florence has an overall moderate risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Florence is in the center and the east of the Township. Overall, 23% of the land area in the Township is considered exposed to landslides.

Figure 6.7.7 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.7.7: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

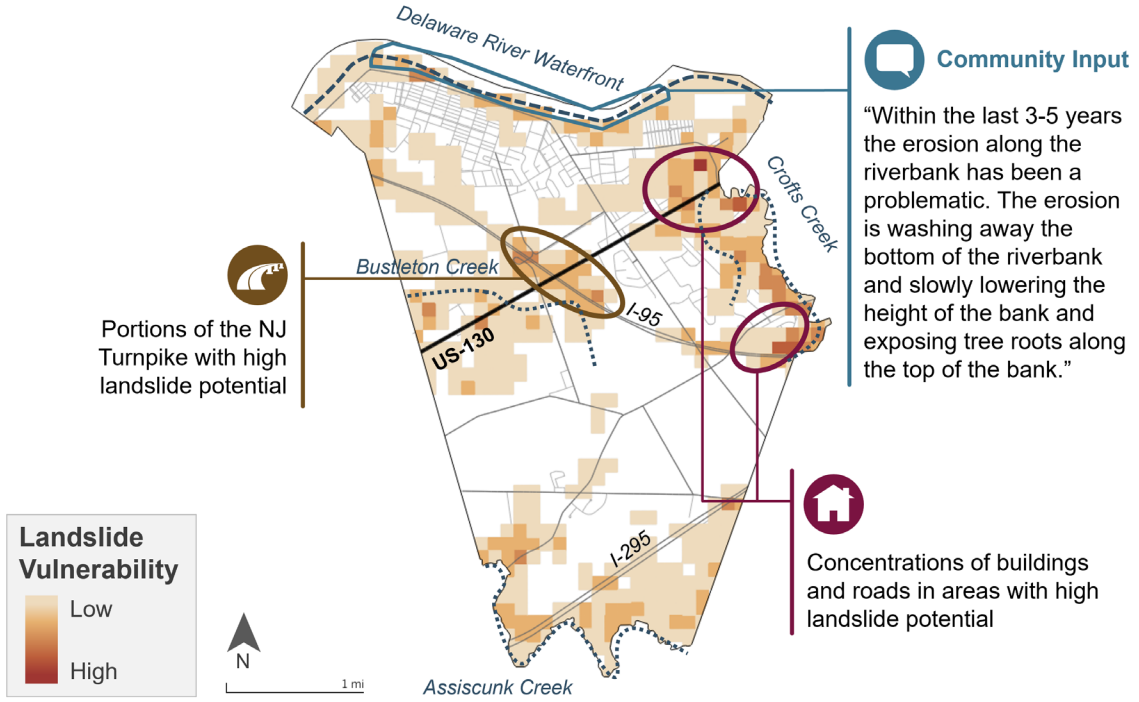


FIGURE 6.7.8: Landslide exposure for four themes in Florence Township.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 13% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 2% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the northeast.

CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include multiple Land Mobile Private Towers, a Microwave Tower, multiple gas stations, a pumping station, multiple sewage plant buildings, and a water tower. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides include East Front St and the NJ Turnpike Extension.

NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 563 acres, or 37% of forests, shrublands, and wetlands, are in areas modeled as having some level of landslide exposure, and 9% of forests and shrublands, and 4% of wetlands have between moderate and high exposure. Similarly, 791 acres, or 25%, of wildlife habitat areas also have known landslide exposure. These areas are concentrated in the center of the Township.

SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the north have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include along the Delaware River.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.7.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.7.5: Distribution of landslide exposure scores for land area and assets in Florence Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	6,202 Acres	4,747 (77%)	650 (10%)	559 (9%)	221 (4%)	24 (<1%)	1 (<1%)
Community Resources							
Residential Buildings	3,394 Assets	2,948 (87%)	202 (6%)	171 (5%)	73 (2%)	--	--
Public & Commercial Buildings	511 Assets	431 (84%)	47 (9%)	23 (5%)	10 (2%)	--	--
Agricultural Land	1,260 Acres	1,180 (94%)	48 (4%)	25 (2%)	8 (1%)	--	--
Preserved Farmland	326 Acres	306 (94%)	14 (4%)	6 (2%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	39 Assets	26 (67%)	6 (15%)	6 (15%)	1 (3%)	--	--
Health & Emergency Services	3 Assets	3 (100%)	--	--	--	--	--
Hazardous Material Sites	10 Assets	8 (80%)	1 (10%)	--	1 (10%)	--	--
Transportation Routes	99 Miles	68 (69%)	16 (16%)	13 (13%)	3 (3%)	0.01 (<1%)	--
Evacuation Routes	15 Miles	5.2 (35%)	3.6 (24%)	4.8 (32%)	1.2 (8%)	--	--
Natural Infrastructure							
Forests & Shrubland	766 Acres	417 (54%)	142 (18%)	139 (18%)	57 (7%)	12 (2%)	--
Wildlife Habitat Areas	3,142 Acres	2,351 (75%)	323 (10%)	307 (10%)	141 (4%)	20 (1%)	--
Wetlands	761 Acres	548 (72%)	106 (14%)	72 (9%)	31 (4%)	4 (<1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Florence has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Florence is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if the infrastructure in Florence is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Florence is highest in the southern region of the Township, with additional select areas of higher wildfire potential in the northeastern portion of the Township as well. These areas of relatively higher wildfire hazard potential are majority forest and agriculturally based. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. 20% of the land area in the Township has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

Figure 6.7.9 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.7.9: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

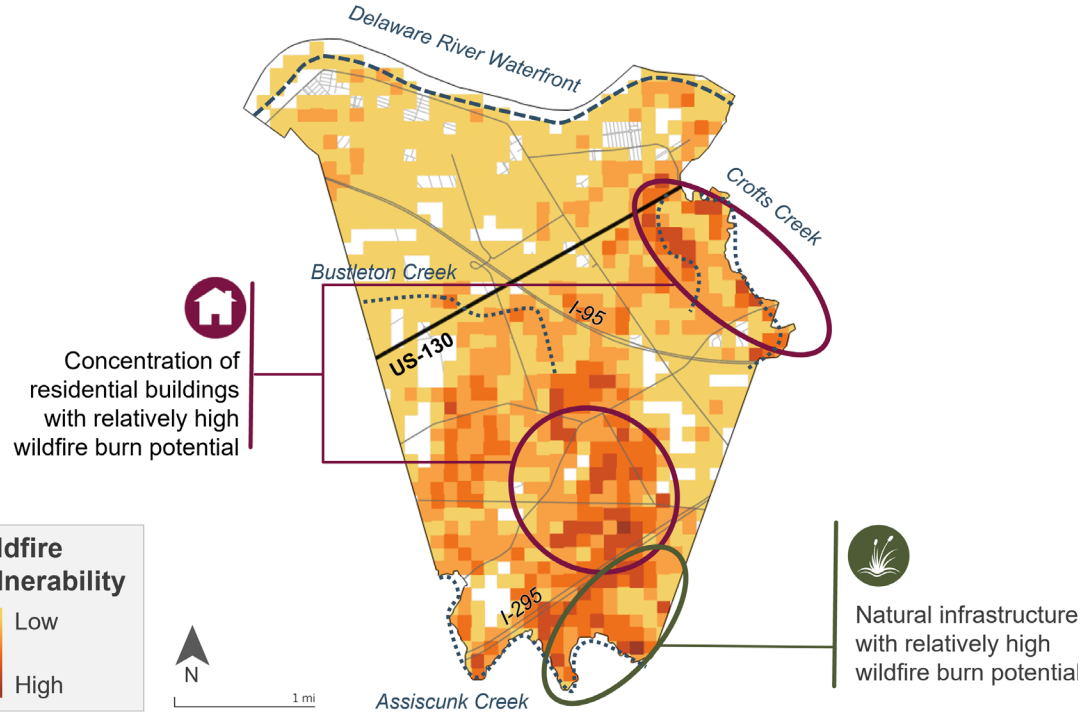
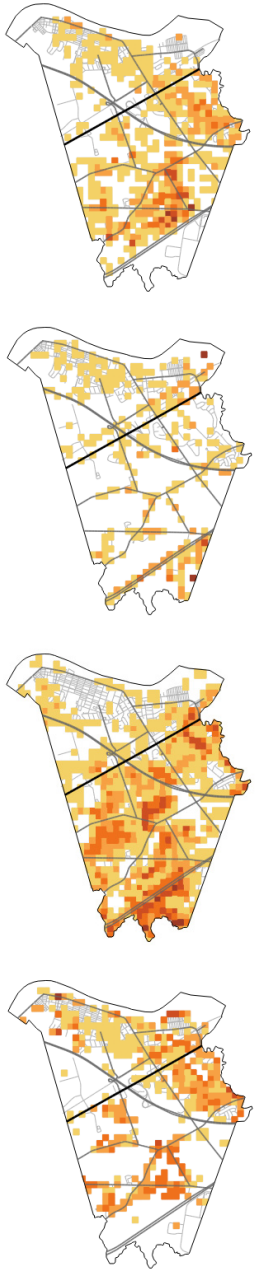


FIGURE 6.7.10: Wildfire exposure for four themes in Florence Township.



COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings are outside of areas exposed to wildfire. Buildings near undeveloped open spaces and vegetated areas are most likely to face wildfire exposure, such as in residential communities east of Potts Mill Rd between US 130 and the New Jersey Turnpike or south around Burlington Columbus Rd, the Cedar Ln Extension, and Old York Rd. Areas with higher density urban development have lower exposure. Around 8% of buildings and 25% of agricultural lands have an annual likelihood of burning of at least 0.05%. Agricultural land is most exposed when adjacent to naturalized areas, such as east of Cheecha Farm and Coachman Dr.

CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas include the former Roebling Steel Company in the northeast of the Township, and the Florence Land Recontouring Landfill in the southeastern portion of the Township. Roadways in more wildfire-prone areas include I-295, Scale House Rd, Recovery Blvd, and Jacksonville Rd. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.

NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands and wetlands in the south of the Township, directly above Assiscunk Creek, have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.

SOCIAL FABRIC

If wildfires touch communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires in surrounding areas can still cause harm to Florence residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the northeast and northwest have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.7.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.7.6: Distribution of heat exposure scores for land area and assets in Florence Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	6,202 Acres	3,531 (57%)	118 (2%)	252 (4%)	1,073 (17%)	706 (13%)	433 (7%)
Community Resources							
Residential Buildings	3,394 Assets	2,775 (82%)	84 (2%)	73 (2%)	226 (7%)	236 (7%)	--
Public & Commercial Buildings	511 Assets	426 (83%)	4 (1%)	11 (2%)	30 (6%)	39 (8%)	1 (<1%)
Agricultural Land	1,260 Acres	959 (76%)	3 (<1%)	15 (1%)	110 (9%)	164 (13%)	10 (1%)
Preserved Farmland	326 Acres	183 (56%)	2 (<1%)	4 (1%)	18 (6%)	86 (26%)	32 (10%)
Critical Infrastructure							
Utility Infrastructure	39 Assets	37 (95%)	1 (3%)	--	1 (3%)	--	--
Health & Emergency Services	3 Assets	3 (100%)	--	--	--	--	--
Hazardous Material Sites	10 Assets	8 (80%)	--	--	--	--	2 (20%)
Transportation Routes	99 Miles	82 (82%)	2 (2%)	2 (2%)	6 (6%)	4 (4%)	3 (3%)
Evacuation Routes	15 Miles	13 (87%)	0.1 (<1%)	0.2 (1%)	1 (10%)	0.3 (2%)	--
Natural Infrastructure							
Forests & Shrubland	766 Acres	122 (16%)	21 (3%)	85 (11%)	249 (32%)	212 (28%)	78 (10%)
Wildlife Habitat Areas	3,142 Acres	1,408 (45%)	35 (1%)	57 (2%)	678 (22%)	655 (21%)	310 (10%)
Wetlands	761 Acres	48 (6%)	8 (1%)	27 (4%)	332 (44%)	171 (22%)	174 (23%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Florence Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Florence Township ranges from slightly drought vulnerable to drought vulnerable land. Nearly half of the land area in the Township (47%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Florence are spread throughout but have a higher concentration on the western side of the Township.

Figure 6.7.11 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.7.11: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Florence Township.

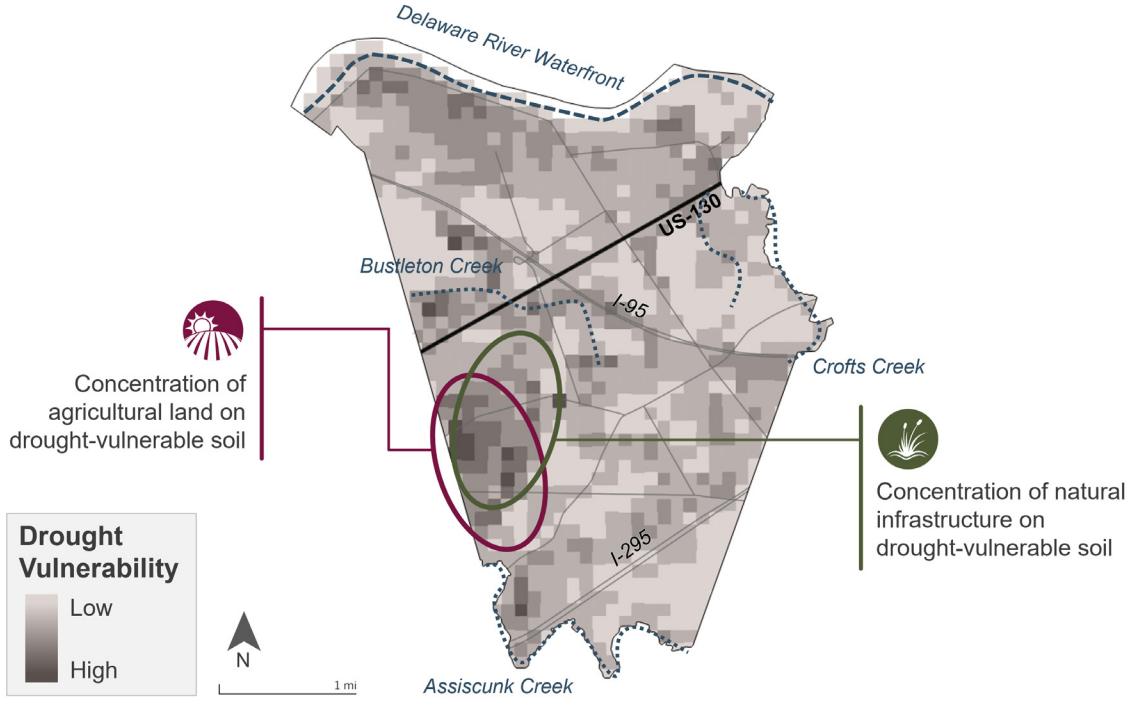


FIGURE 6.7.12: Drought exposure for four themes in Florence Township



COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. Around 15% of agricultural land in the Township is on highly drought-vulnerable soil, concentrated on the western side. Nearly two-thirds of all buildings (66%) are also on land modeled to be drought-vulnerable, concentrated in the north. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm from drought.

CRITICAL INFRASTRUCTURE

Nearly two-thirds of critical infrastructure assets in the Township are on drought-sensitive soil. Between 62% and 70% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, concentrated in the north. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.

NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Florence Township, 23% of wetlands and 44% of forests and shrublands are modeled to have drought-vulnerable soil, spread throughout the Township, but mostly concentrated on the western side.

SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the north have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.7.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.7.7: Distribution of drought exposure scores for land area and assets in Florence Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	6,202 Acres	3 (<1%)	569 (9%)	2,072 (33%)	659 (11%)	2,899 (47%)
Community Resources						
Residential Buildings	3,394 Assets	3 (<1%)	159 (5%)	924 (27%)	70 (2%)	2,238 (66%)
Public & Commercial Buildings	511 Assets	--	28 (5%)	122 (24%)	38 (7%)	323 (63%)
Agricultural Land	1,260 Acres	--	226 (18%)	719 (57%)	121 (10%)	195 (15%)
Preserved Farmland	326 Acres	--	81 (25%)	227 (70%)	18 (6%)	--
Critical Infrastructure						
Utility Infrastructure	39 Assets	--	2 (5%)	10 (26%)	3 (8%)	24 (62%)
Health & Emergency Services	3 Assets	--	--	1 (33%)	--	2 (67%)
Hazardous Material Sites	10 Assets	--	--	1 (10%)	2 (20%)	7 (70%)
Transportation Routes	99 Miles	--	5 (5%)	24 (25%)	4 (5%)	62 (65%)
Evacuation Routes	15 Miles	--	0.1 (1%)	0.9 (6%)	1.6 (11%)	12.2 (83%)
Natural Infrastructure						
Forests & Shrubland	766 Acres	--	31 (4%)	249 (33%)	149 (19%)	337 (44%)
Wildlife Habitat Areas	3,142 Acres	3 (<1%)	488 (16%)	1,257 (40%)	535 (17%)	859 (27%)
Wetlands	761 Acres	0.7 (<1%)	194 (25%)	167 (22%)	221 (29%)	179 (23%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Florence Township has taken clear steps toward integrating climate resilience into its planning framework. While earlier planning documents touched on environmental protection and smart growth, in 2022, the Township adopted a CCRHVA. Through adopting a CCRHVA, the Township now has a more structured and targeted approach. Climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1994 Master Plan Reexamination emphasized confining higher-density housing to areas with existing infrastructure and protecting "wetlands, floodplains, water bodies and other environmentally sensitive areas" from development.
- The 2000 Master Plan Reexamination pushed further by advocating for natural state preservation of uplands, reforestation, and stronger conservation-oriented clustering provisions, suggesting that Florence was beginning to weigh development decisions against environmental constraints.
- In 2007, Township furthered these ideas outside of the non-manmade environment by formally integrating renewable energy into its planning objectives. The 2007 Master Plan Reexamination introduces new language promoting "small scale alternative energy generating facilities" and highlights their role in reducing pollution and promoting renewable energy throughout the Township.
- Florence Township adopted its Municipal Stormwater Management Plan in October 2021 to comply with NJDEP requirements. The plan outlines strategies to manage runoff, reduce flooding, protect water quality, and safeguard sensitive environmental areas. It emphasizes best management practices such as groundwater recharge, pollutant filtration, and erosion control.
- The most substantial climate change policy shift in Florence came in the 2022 Master Plan Update, in which the Township introduced a dedicated section on storm resiliency, environmental sustainability, and hazard mitigation, as well as its CCRHVA. Rather than just acknowledging climate issues, the Township now explicitly encourages staying informed on resilience strategies that influence land use, infrastructure, and long-term planning decisions.
- The 2022 CCRHVA analyzes current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards. In Florence Township, the threats and vulnerabilities analyzed include temperature, rainfall, severe storms, drought, natural disasters, flooding, and

sea level rise. As part of the CCRHVA, a buildout analysis was conducted, and it was determined that although the Township is predominantly built out, it can accommodate additional residential and non-residential development. Finally, the document evaluates the impact on the Master Plan, provides strategies and design standards, and provides a policy statement.

- Chapter 79, Floodplain Management Regulations, adopted by the Mayor and Council of the Township of Florence on September 4, 2024, by Ordinance No. 2024-11, sets forth the Township's policy framework for managing development in flood-prone areas. The chapter aims to safeguard public welfare and reduce flood-related losses by regulating all activities within designated flood hazard zones. It also designates the Floodplain Administrator as the official responsible for interpreting and enforcing the ordinance in alignment with NJDEP requirements and local standards.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Florence Township has a high hazard rating for severe weather; medium ratings for disease outbreak, drought, extreme temperatures, and severe winter weather; and low ratings for dam failure, earthquake, flood, and wildfire. The Township demonstrates a high adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter weather, and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVI found minimal highest-risk areas within the Township, with small concentrations in the southern and eastern portions of the Township. The highest-risk areas are located adjacent to the Assiscunk Creek along with the southern municipal boundary and adjacent to the Crafts Creek along the eastern municipal boundary. The moderate-risk areas are located throughout the Township with concentrations around Bustleton Creek, Assiscunk Creek, Crafts Creek, and the Delaware River. The lower-risk CVI classification makes up the majority of the Township. The Delaware River waterfront in Florence has limited higher and moderate-risk areas, with the exception of a pocket of moderate risk in between the waterfront and the Roebling neighborhood, when compared to other waterfront communities in the County. The Life Center Academy, on Burlington Columbus Rd, is located in a moderate-risk area.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. *See Florence Township 2022 CCRHVA for build-out analysis at the time of the Township's last analysis of climate change-related hazard vulnerabilities.*

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and

historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The Township has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Township has a few redevelopment areas noted.

- 1200 John Galt Way - This is a commercial warehouse redevelopment. It would comply with current zoning.
- Route 130 Affordable Housing - 7.75 acres to be developed with 54 additional units proposed to be constructed.
- Senior Housing Development in Roebling proper by 10th Ave - 34 units.
- The John A. Roebling Steel Plant and Environs - will most likely be a non-residential development.

ROUND IV OF AFFORDABLE HOUSING

The DCA determined the Round 4 Present Need as 42, and a Prospective Need of 107 units of affordable housing. Through Resolution 2025-49, the Township accepted DCA's number. The Township prepared an HEFSP outlining several mechanisms to address their Round IV Obligation, including 100% affordable development and extensions of controls for existing affordable units. The HEFSP was adopted by the Planning Board through Resolution PB-2025-06 on May 27, 2025.

Project Freedom Hornberger Phase II is one of the 100% affordable projects that is proposed, consisting of 54 units. The Phase II expansion site comprises 7.75 acres of land located along the northwestern side of Route 130 and currently includes three single-family residences on three lots (Block 121, Lots 4.05, 4.06, and 4.07). This site was determined to be suitable, approvable, available, and developable in the HEFSP. The northern and western portions of the site contain wetlands, floodplains, riparian buffers, and steep slopes. The net developable area of the site is approximately 5.5 acres. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Another 100% affordable development that the Township is proposing to address the Round IV obligation is the Project Freedom Roebling Senior/VFW, which includes 36 total affordable senior rental units. This site is approximately 8.87 acres of land located in the Roebling neighborhood along the northerly side of Hornberger Ave, including Block 126.01 Lots 1.01, 5, a portion of Lot 7, a portion of Lot 3, and a paper street located between Lots 1.01 and 5. This site was determined to be suitable, approvable, available, and developable in the HEFSP. There are no wetlands, floodplains, steep slopes, or Category One streams that encumber the site. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

The final 100% affordable development is a scattered sites – municipal small development program, which includes 440 West Fourth St (Block 31, Lot 1), 629 West Third St (Block 18, Lot 7), and 207-209 Iron St (Block 15, Lots 3 and 4.01). The Township's HEFSP did not provide site suitability for these properties. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Resilience Strategy

Florence Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Florence Township.

> Florence Township is committed to building a safe, sustainable, and resilient future for our community. While flooding is less of a concern here than in neighboring riverfront towns, Florence faces other climate challenges that demand thoughtful action. Rising temperatures increase the need for tree planting and green infrastructure to provide shade, improve air quality, and cool our neighborhoods. Along the Delaware River and Crafts Creek, erosion and bank instability threaten homes, natural habitats, and local landscapes, while periods of drought impact farms and the broader economy. Florence Township is dedicated to addressing these challenges by protecting open spaces, supporting sustainable agriculture, strengthening natural defenses, and investing in smart infrastructure. Our goal is to ensure that Florence remains a healthy, thriving, and forward-looking community for residents today and for future generations.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

FLORENCE TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects

of similar type and scale.

- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.7.13: View of the Florence Township Community Center. *(Source: Florence Township)*



FLORENCE TOWNSHIP RESILIENCE ACTION

Riverbank Stabilization

Implement riverbank stabilization measures to reduce erosion for shorelines along the Delaware River and surrounding creeks. This may include reinforcing eroding riverbanks with native vegetation, riprap, or engineered retaining structures to avoid the risk of landslides. Stabilized banks prevent further erosion, protect nearby properties, and reduce sedimentation in waterways. Vegetated solutions also improve water quality and habitat conditions. For private properties, programs may be set up to support and incentivize action on private land.

RESPONSIBLE PARTY	Florence Township, NJDEP, USACE
ESTIMATED COSTS	$100K - $5M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

★★★★★

High

FLORENCE TOWNSHIP RESILIENCE ACTION

Expand Tree Canopy

Expand the tree canopy from Winter St and westward, heading towards the river to improve shade and reduce the heat island effect. Promote tree planting on both public and private properties through incentive programs, volunteer planting events, and homeowner education.

RESPONSIBLE PARTY Florence Township

ESTIMATED COSTS $50K - $100K

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★★★

High

FLORENCE TOWNSHIP RESILIENCE ACTION

Erosion Control Policy

Explore the use of policy solutions, such as stream buffer ordinances or riparian zone protections, to regulate and enforce erosion control measures along the river and creeks.

RESPONSIBLE PARTY Florence Township, NJDEP

ESTIMATED COSTS $0 - $100K (costs vary depending on strategy)

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

FLORENCE TOWNSHIP RESILIENCE ACTION

Public Outreach and Enforcement to Prevent Dumping

In Florence Township, several nearby property owners have historically dumped debris and yard waste along the riverbank. This illegal dumping has led to the erosion of natural vegetation, underbrush, and root systems, reducing the stability of the bank. The loss of riparian vegetation increases stormwater runoff, sedimentation, and flood risk for adjacent properties. This action aims to restore and protect local riverbanks through a combination of public education and enforcement. Develop a public information campaign explaining the environmental and legal consequences of dumping, promote best practices for debris disposal, and collaborate with local groups to encourage community stewardship. Florence Township will also designate local staff or code enforcement officers to monitor riverbank areas for dumping.

RESPONSIBLE PARTY Florence Township

ESTIMATED COSTS $0K - $100K (costs vary depending on strategy)

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium

FLORENCE TOWNSHIP RESILIENCE ACTION

Update Zoning to Support Lower Density and Green Space Preservation

Review and update local zoning regulations to encourage less dense residential development (e.g., expansion of RA zoning) in neighborhoods near Winter St and westward to the river. Reduced density and increased open space will provide greater opportunities for tree planting and landscaping.

RESPONSIBLE PARTY Florence Township

ESTIMATED COSTS $0K - $50K

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★☆☆

Medium



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

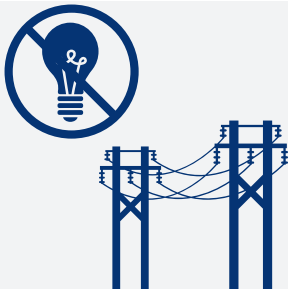


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



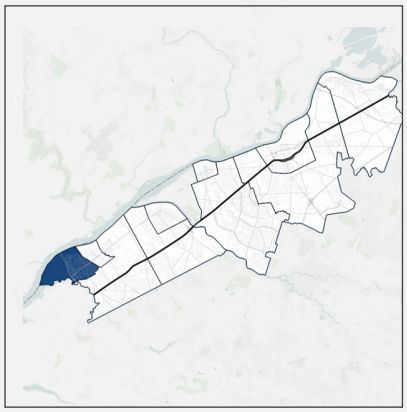
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.8: Palmyra Borough CCRHVA



Summary of Vulnerabilities and Resilience Actions for Palmyra Borough

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Palmyra Borough and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Palmyra Borough can be found in the west of the Borough along the Delaware River.



Sea Level Rise: Sea level rise is a growing concern for Palmyra. The overall extent of sea level rise hazard exposure in the Borough is moderate, and tidal inundation driven by sea level rise is concentrated in the center of the Borough.



Heat: Palmyra Borough has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Borough can be found in the eastern portion of the Borough, and are generally caused by high amounts of impervious surfaces and lower amounts of green space in these areas.



Landslide: Palmyra has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Palmyra is in the west.



Wildfire: Palmyra has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Palmyra is highest in the west, closest to the Delaware, as it is a majority greenspace in that area.



Drought: Palmyra Borough has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Palmyra Borough ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Palmyra Borough's vulnerability assessment, and include:

- Construct a Stormwater Surge Basin at the Public Works/Sewer Facility
- Temple/Firth Underground Drainage System Expansion
- Garfield Ave Stormwater Outfall Tide Gate
- Tacony Palmyra Bridge Tide Gate and Basin
- Public Works Flood Mitigation
- Property Acquisition
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Palmyra Borough (the Borough) contains a population of 7,447 and sits on the southernmost extent of the Project corridor. The Borough is situated east of Pennsauken Creek, north of Cinnaminson Township, and west of Riverton Borough. The southwestern portion of the Borough along the Delaware River is a large undeveloped cove that is used as a nature park, and north of that is a Dredge Detention Basin surrounded by trails and public open space. The portions of the Borough fronting Pennsauken Creek contain industrial uses, warehousing space, and auto businesses. The northern portion of the Delaware waterfront is occupied by a private access apartment complex, while the rest of the Borough is predominantly built out with single-family residential uses. The Borough's commercial center is located on Broad St, where the River LINE light rail runs along, and a station is located. **Table 6.8.1** shows socially vulnerable populations in Palmyra Borough. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.8.1: Socially vulnerable populations in Palmyra Borough.

DEMOGRAPHIC VARIABLE	PALMYRA BOROUGH	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	7,447	--	9,267,014	--
Total Household Units	3,406	--	3,775,842	--
Occupied Housing Units	3,283	--	3,478,355	--
Vacant Housing Units	123	--	297,487	--
Population 18 or Younger	1,323	17.80%	2,031,322	21.90%
Population 65 or Older	1,166	15.66%	1,559,816	16.83%
Population with a disability	1,119	**15.00%**	975,308	10.60%

DEMOGRAPHIC VARIABLE	PALMYRA BOROUGH	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons without a high school diploma	293	5.39%	600,736	9.30%
Persons below poverty level	1,156	15.53%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	5.70%	N/A*	6.20%
Persons uninsured	421	5.70%	682,266	7.40%
Persons who speak English "less than well"	147	2.03%	562,865	6.44%
Single Parent households	227	**6.91%**	198,943	5.72%
Minority Ethnicity (non-white)	2,730	36.66%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	331	7.59%	639,960	16.95%
Crowded housing units	15	0.46%	129,710	3.73%
Households with no vehicle	143	4.40%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Borough of Palmyra, Borough of Riverton, Cinnaminson Township, Delran Township, and Riverside Township took place on April 24th, 2025, from 6:30 to 8:30 p.m. Approximately 35 stakeholders attended the meeting, including the mayors of Delran, Borough of Riverton, and Riverside, and council members. One attendee was affiliated with Palmyra Borough. The attendee from Palmyra was primarily concerned with issues of flooding in low-lying residential areas and a lack of infrastructure in place to manage the increase in water flow, a lack of coordination between utilities and the municipality, and drought impacts. Problem areas identified include the community center, which was noted as underutilized, historic homes with limited flood resistance, the Highland Ave Sewers, and the riverbank. The stakeholder from Palmyra

indicated that the area surrounding Palmyra Cove and the neighboring nature trail, the riverbank, and the Palmyra Community Center as the most valuable community assets.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

One attendee was from Palmyra Borough. The attendee noted their support for data collection and analysis as well as support for large-scale community projects, programmatic actions, and partnerships.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Cinnaminson Township, Palmyra Borough, and Riverton Borough in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Palmyra.

A Palmyra representative noted that one-third of the Borough is in the floodplain and the Borough has high groundwater, contributing to flooding issues. Areas particularly prone to flooding in Palmyra include homes along the Pennsauken Creek and on Temple Ave near Cinnaminson Ave. To address the Temple Ave flooding, the Borough has added rain gardens with water storage tanks. The tanks hold the stormwater until it can be discharged into the River.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of

FIGURE 6.8.1: Independence Fire Company in Palmyra Borough. *(Source: Mr. Matté, Wikimedia Commons, CC-BY-SA-4.0)*



the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed and the information needed for the development of all actions were discussed. The draft policy statements were also reviewed.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Palmyra officials noted that they may be interested in all four of the regional actions mentioned: continuation of road maintenance to respond to climate change impacts, expansion of NJDEP's Blue Acres program, stream cleaning, bank stabilization, and channel restoration, and coordinated response to power outages. Six additional, potential resilience actions were discussed: (1) expansion of the underground storage of the Temple/Firth drainage system, (2) construct a stormwater surge basin at the public works/seer facility, (3) construct a tide gate at the Garfield Ave stormwater outfall, (4) coordinate with the Burlington County Bridge Commission to construct a tide gate and basin for the Market St outfall system, (5) critical infrastructure flood hazard mitigation for public works/sewer department equipment storage building, and (6) buy houses at Temple and Maryland to expand the basin.

Vulnerability Assessment

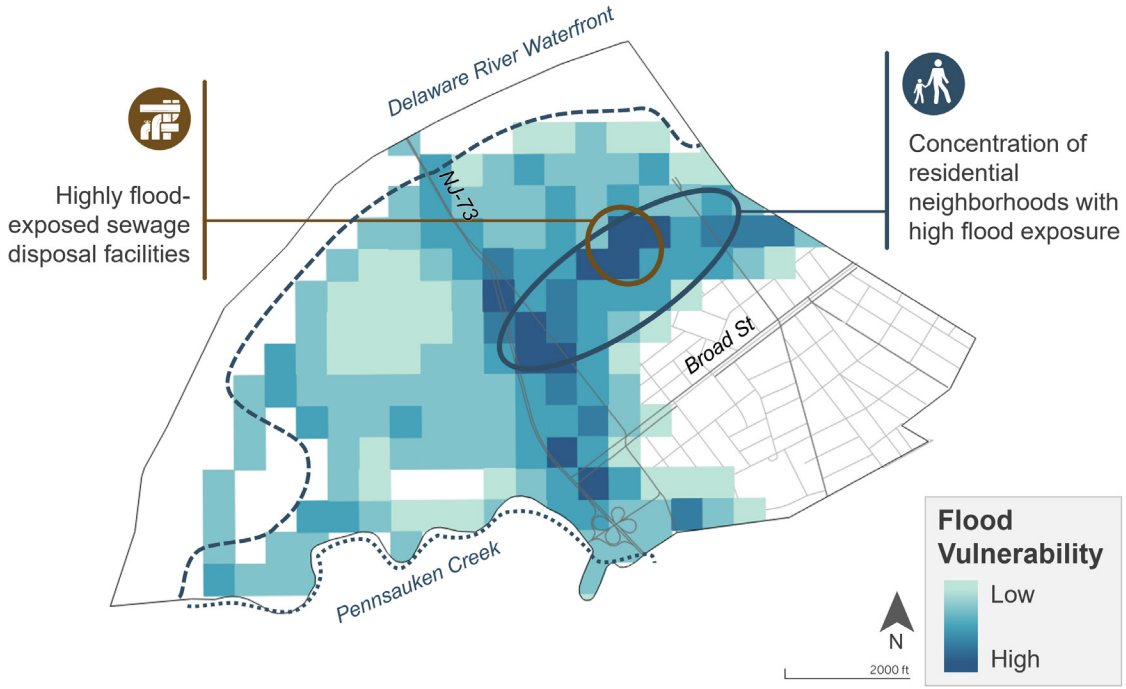
The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

Flooding

Flooding is a significant area of concern for residents and community leaders in Palmyra Borough and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Palmyra Borough is in the west of the Borough along the Delaware River.

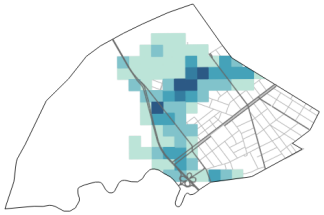
FIGURE 6.8.2: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.



These areas represent 40% of the land area in the Borough, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Borough (62%) is within a modeled floodplain used in this analysis.

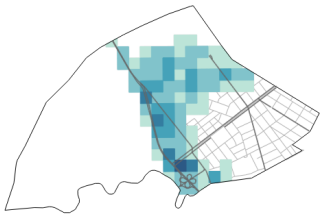
Figure 6.8.2 shows the spatial distribution of flood vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding

FIGURE 6.8.3: Flood exposure for four themes in Palmyra Borough.



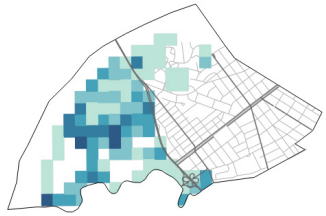
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Palmyra Borough, approximately 9%, or 207, of the 2,357 residential buildings in the Borough are classified as having high flood exposure (within a 1% annual chance floodplain today), and 24%, or 44, of the 186 public and commercial buildings have high exposure, spread throughout the northern and western portion of the Borough.



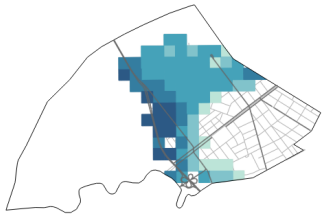
CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Palmyra Borough, 46% of utility infrastructure and 20% of health and emergency service facilities have a high exposure to flooding, including the Burlington County Bridge Commission Police Station on the Tacony-Palmyra bridge and the Palmyra Astro Service Station. Additionally, Frank's Auto Services is a hazardous material site with flood exposure, with the potential for releases resulting in public health concerns and environmental damage. Nine miles of transportation routes in the Borough also have high flood exposure, and approximately two miles of those are evacuation routes. State Highway 73 has the highest mileage exposed, with 1.3 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Palmyra Borough, 110 acres, or 52%, of forests and shrublands in the Borough are exposed to high levels of flooding, in the western portion of the Borough along the Delaware River. Similarly, 95% of wetlands are also within high flood exposure areas, along the Delaware River and Pennsauken Creek, but wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the west have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along the Delaware River and Pennsauken Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.8.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.8.2: Distribution of flood exposure scores for land area and assets in Palmyra Borough based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	1,171 Acres	448 (38%)	73 (6%)	176 (15%)	474 (40%)
Community Resources					
Residential Buildings	2,357 Assets	1,573 (67%)	105 (4%)	471 (20%)	207 (9%)
Public & Commercial Buildings	186 Assets	96 (52%)	11 (6%)	35 (19%)	44 (24%)
Critical Infrastructure					
Utility Infrastructure	28 Assets	9 (32%)	1 (4%)	5 (18%)	13 (46%)
Health & Emergency Services	5 Assets	4 (80%)	--	--	1 (20%)
Hazardous Material Sites	10 Assets	2 (20%)	1 (10%)	6 (60%)	1 (10%)
Transportation Routes	33 Miles	16 (49%)	2 (6%)	6 (19%)	9 (26%)
Evacuation Routes	3 Miles	0.03 (1%)	0.4 (11%)	0.9 (28%)	1.8 (60%)
Natural Infrastructure					
Forests & Shrubland	211 Acres	40 (19%)	33 (16%)	28 (13%)	110 (52%)
Wetlands	58 Acres	0.1 (<1%)	--	3 (4%)	56 (95%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a growing concern for Palmyra. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware River and Pennsauken Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the center of the Borough. Across the Borough, 112 acres, or 10%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Borough is moderate, as almost 40% of the land has some exposure in the model. Around the end of the century, 36% of the land area in the Borough may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.8.4 shows the spatial distribution of sea level rise vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.8.4: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.

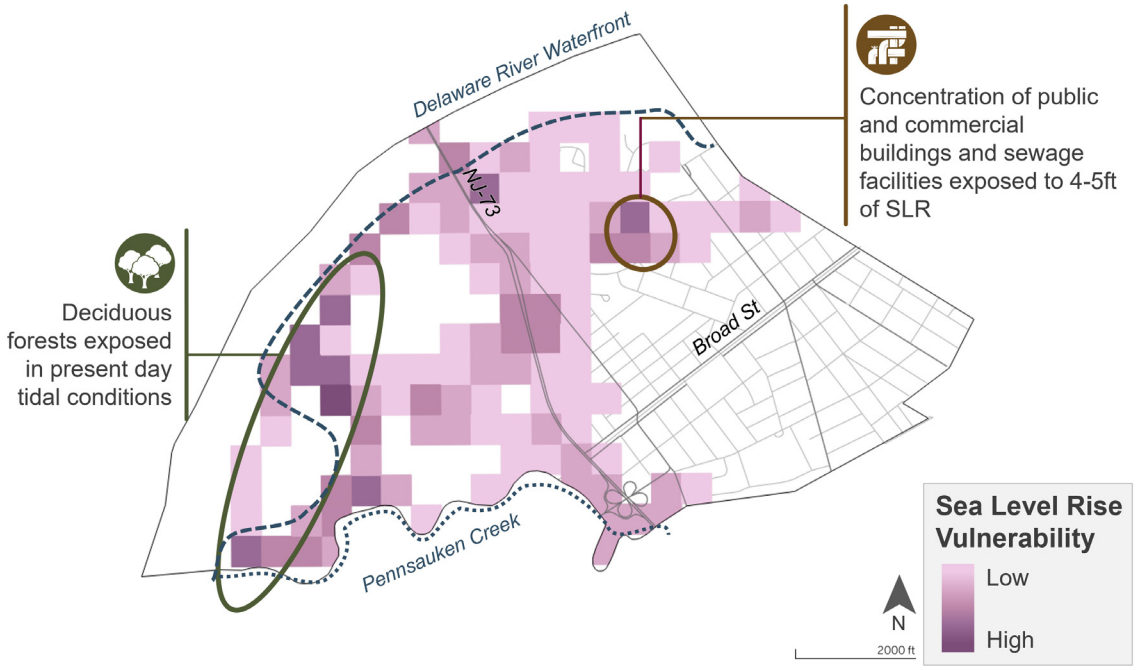
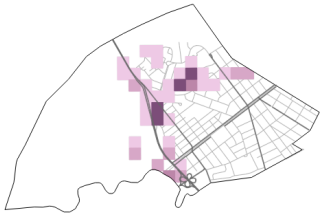
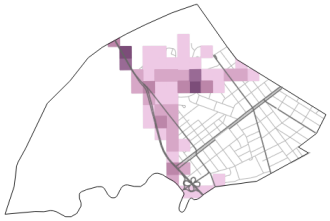


FIGURE 6.8.5: Sea level rise exposure for four themes in Palmyra Borough.



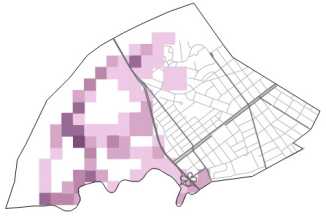
COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Palmyra, zero homes and one public and commercial building would be exposed to tidal inundation at three feet of sea level rise, and 107 and 24, respectively, would be exposed at five feet. These buildings are concentrated in the center of the Borough.



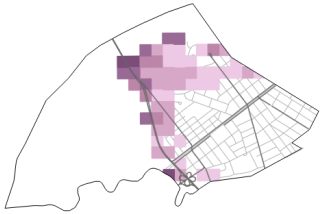
CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Palmyra, 12 critical infrastructure assets and 8.8 miles of roadway are exposed to 4-5 feet of tidal inundation. This includes a land mobile private tower, Palmyra Astro Service Station, and multiple sewage treatment plant buildings.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 53 acres, representing 91%, of wetlands in the Borough are exposed to 4-5 feet of tidal inundation, concentrated in the western portion of the Borough, especially in the southwest corner. Similarly, 48% of forests and shrublands, are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the western part of the Borough have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.8.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed.

TABLE 6.8.3: Distribution of sea level rise exposure scores for land area and assets in Palmyra Borough based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	1,171 Acres	746 (64%)	103 (9%)	87 (7%)	68 (6%)	31 (3%)	24 (2%)	112 (10%)
Community Resources								
Residential Buildings	2,357 Assets	2,250 (95%)	86 (4%)	21 (1%)	--	--	--	--
Public & Commercial Buildings	186 Assets	144 (77%)	16 (9%)	6 (3%)	1 (1%)	--	--	--
Critical Infrastructure								
Utility Infrastructure	28 Assets	17 (61%)	3 (11%)	7 (25%)	--	--	--	1 (4%)
Health & Emergency Services	5 Assets	4 (80%)	1 (20%)	--	--	--	--	--
Hazardous Material Sites	10 Assets	10 (100%)	--	--	--	--	--	--
Transportation Routes	33 Miles	26 (77%)	4 (12%)	3 (8%)	0.4 (1%)	--	0.02 (<1%)	1 (2%)
Evacuation Routes	3 Miles	1.2 (40%)	0.6 (18%)	0.4 (12%)	0.4 (13%)	--	--	0.5 (17%)
Natural Infrastructure								
Forests & Shrubland	211 Acres	110 (52%)	3 (1%)	6 (3%)	20 (10%)	10 (5%)	8 (4%)	54 (26%)
Wetlands	58 Acres	5 (9%)	7 (12%)	3 (6%)	5 (8%)	3 (6%)	1 (2%)	34 (57%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Palmyra Borough has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Borough. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Borough can be found in the eastern portion of the Borough. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space in these areas. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 7% of the land area in the Borough has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 22% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.8.6 shows the spatial distribution of heat vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.8.6: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.

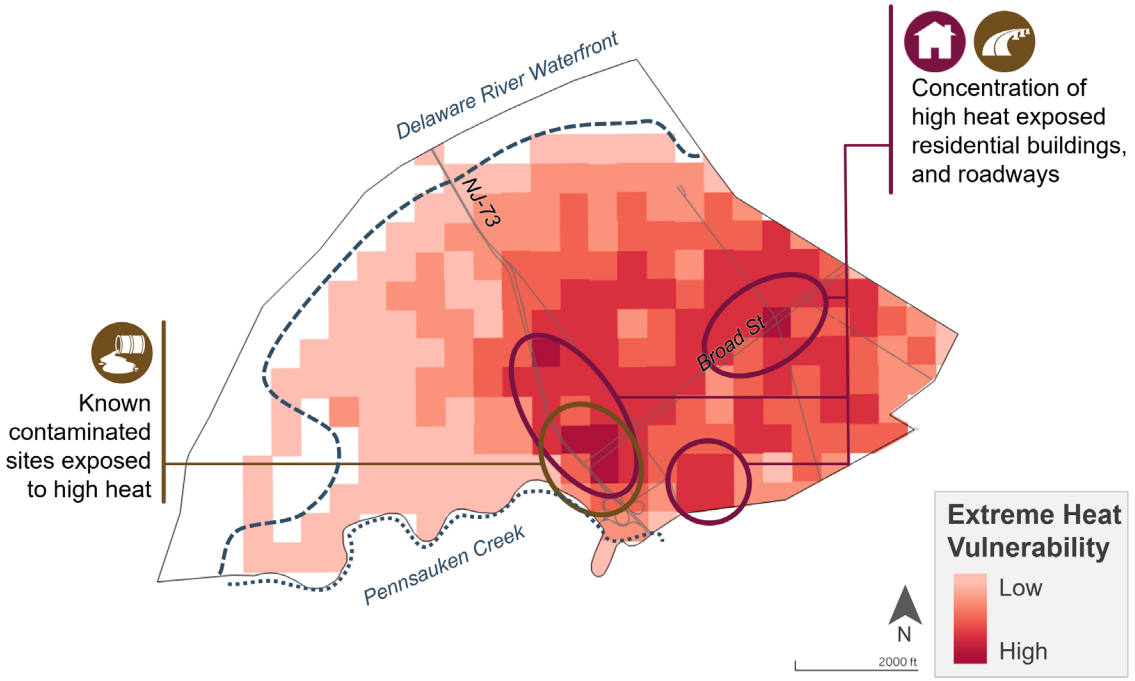
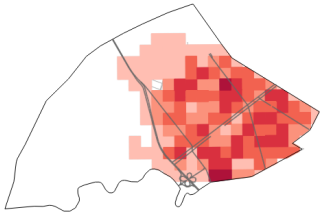
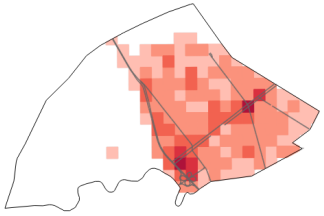


FIGURE 6.8.7: Heat exposure for four themes in Palmyra Borough.



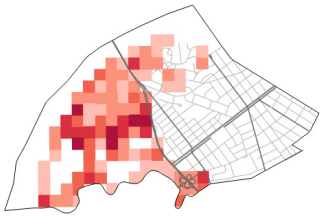
COMMUNITY RESOURCES

In Palmyra Borough, 2% of residential buildings and 25% of public and commercial buildings have at least moderate-high heat exposure, concentrated primarily around Palmyra Bridge Blvd. One public or commercial building has particularly high measured heat exposure: the YesWay Logistics warehouse. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



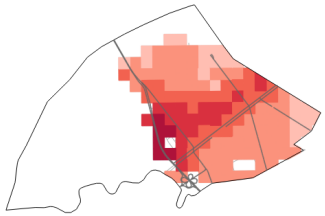
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 14% of utility infrastructure, 20% of health and emergency services, 70% of hazardous material sites, and 13% of transportation routes in the Borough have at least moderate-high heat exposure, primarily concentrated around Palmyra Bridge Blvd. While many critical infrastructure assets are designed not to be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Palmyra Borough, 90% of forests and shrublands and 92% of wetlands are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are in the western portion of the Borough.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the center of the Borough have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.8.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.8.4: Distribution of heat exposure scores for land area and assets in Palmyra Borough based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	1,171 Acres	260 (22%)	232 (20%)	594 (51%)	68 (6%)	17 (1%)
Community Resources						
Residential Buildings	2,357 Assets	--	481 (20%)	1,830 (78%)	46 (2%)	--
Public & Commercial Buildings	186 Assets	--	17 (9%)	124 (67%)	44 (24%)	1 (1%)
Critical Infrastructure						
Utility Infrastructure	28 Assets	1 (4%)	2 (7%)	21 (75%)	4 (14%)	--
Health & Emergency Services	5 Assets	--	1 (20%)	3 (60%)	1 (20%)	--
Hazardous Material Sites	10 Assets	1 (10%)	1 (10%)	1 (10%)	7 (70%)	--
Transportation Routes	33 Miles	0.3 (1%)	4 (11%)	25 (75%)	4 (13%)	0.1 (<1%)
Evacuation Routes	3 Miles	0.3 (11%)	0.6 (22%)	1.2 (40%)	0.9 (29%)	--
Natural Infrastructure						
Forests & Shrubland	211 Acres	139 (66%)	50 (24%)	14 (7%)	3 (1%)	6 (3%)
Wetlands	58 Acres	47 (80%)	7 (12%)	5 (8%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Palmyra has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Palmyra is in the west. Overall, 19% of the land area in the Borough is considered exposed to landslides.

Figure 6.8.8 shows the spatial distribution of landslide vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.8.8: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.

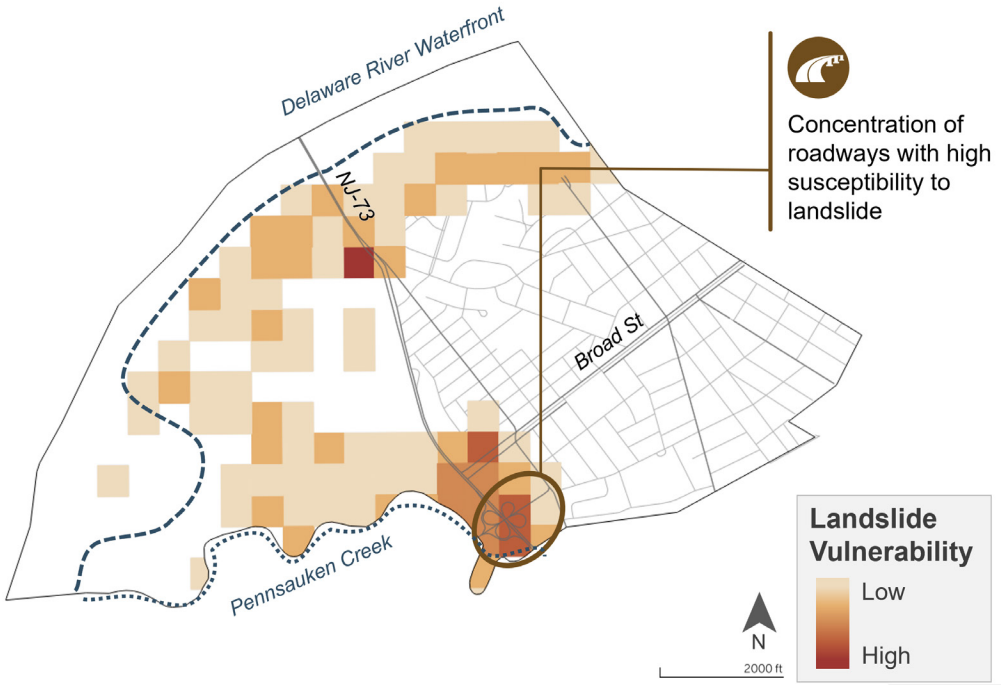
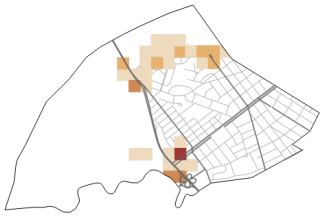
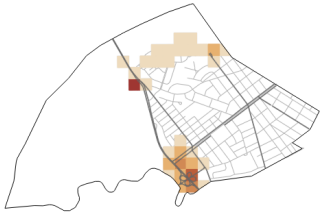


FIGURE 6.8.9: Landslide exposure for four themes in Palmyra Borough.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Borough are outside of areas modeled as susceptible to landslides. Only 3% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.04% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the center, especially in the south.



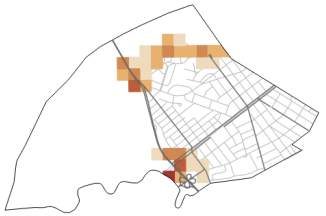
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Borough is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include a Land Mobile Private Tower and the Burlington County Bridge Commission Police Building. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are SR 73, FR Carmen Rd, and New River Rd.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 82 acres, or 30%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 0.2% of forests and shrubland and 2% of wetlands have between moderate and high exposure. These areas are concentrated in the west.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure that communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the west have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include the northwest corner.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.8.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.8.5: Distribution of landslide exposure scores for land area and assets in Palmyra Borough based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	1,171 Acres	957 (82%)	106 (9%)	100 (9%)	8 (1%)	--	--
Community Resources							
Residential Buildings	2,357 Assets	2,298 (97%)	35 (1%)	24 (1%)	--	--	--
Public & Commercial Buildings	186 Assets	170 (91%)	7 (4%)	8 (4%)	1 (1%)	--	--
Critical Infrastructure							
Utility Infrastructure	28 Assets	27 (96%)	--	1 (4%)	--	--	--
Health & Emergency Services	5 Assets	4 (80%)	--	1 (20%)	--	--	--
Hazardous Material Sites	10 Assets	5 (50%)	5 (50%)	--	--	--	--
Transportation Routes	33 Miles	28 (85%)	2 (6%)	2 (7%)	1 (2%)	--	--
Evacuation Routes	3 Miles	1.7 (57%)	0.6 (18%)	0.5 (17%)	0.2 (8%)	--	--
Natural Infrastructure							
Forests & Shrubland	211 Acres	143 (68%)	46 (22%)	22 (11%)	0.4 (<1%)	--	--
Wetlands	58 Acres	45 (77%)	6 (10%)	7 (12%)	1 (1%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Palmyra has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Palmyra is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if the infrastructure in Palmyra is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Palmyra is highest in the west, closest to the Delaware, as it is a majority greenspace in that area. These areas of relatively higher wildfire hazard potential are mostly forest with a small number of wetlands. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. None of the land area in the Borough has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.8.10: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.

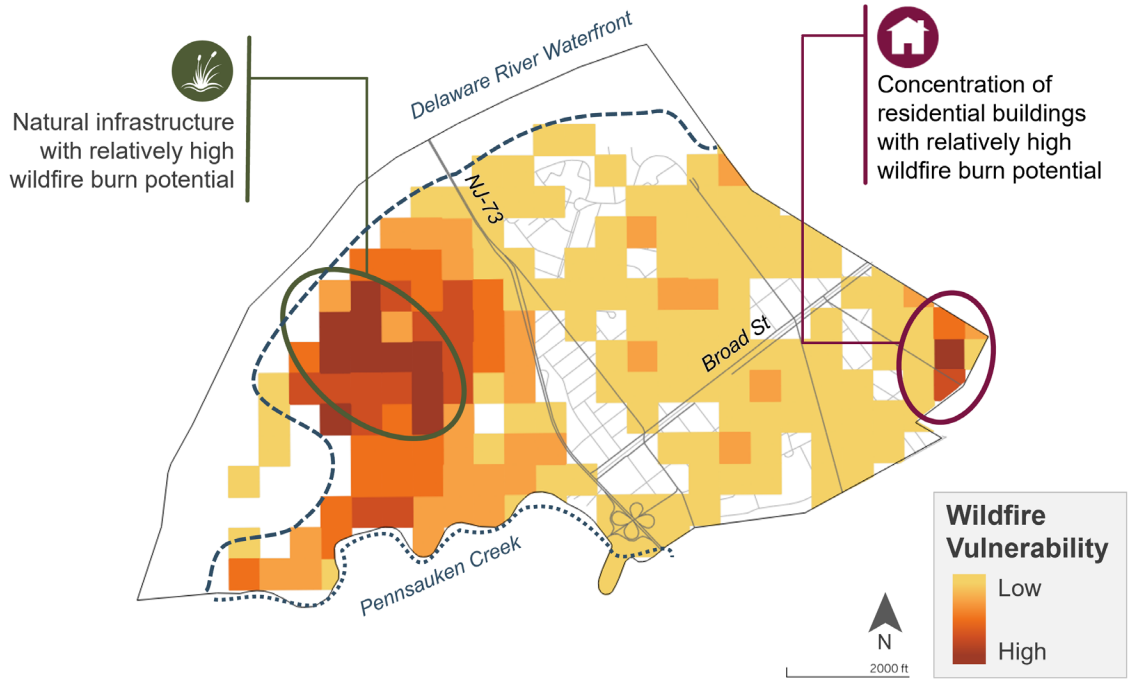
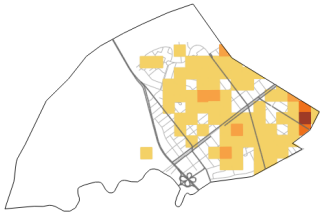


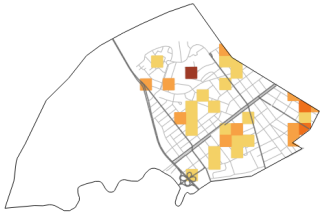
Figure 6.8.10 shows the spatial distribution of wildfire vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.8.11: Wildfire exposure for four themes in Palmyra Borough.



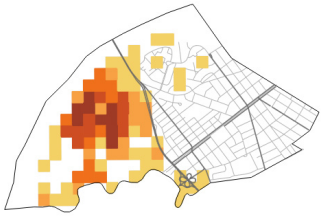
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Palmyra are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face the risk of wildfire exposure. Areas with higher density urban development, meanwhile, have lower exposure. All of the buildings in the Borough have an annual likelihood of burning of less than 0.05%.



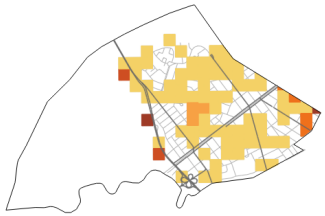
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Borough do not have any known wildfire hazard exposure. Critical infrastructure assets are in more wildfire-prone areas. Roadways in more wildfire-prone areas include Lincoln Ave, Highland Ave, Midway Ave, and Washington Ave. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands in the west and wetlands, also in the west, have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Palmyra communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires in the surrounding areas can still cause harm to Palmyra residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the west, especially Little Round Tree Park, have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.8.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.8.6: Distribution of heat exposure scores for land area and assets in Palmyra Borough based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	1,171 Acres	768 (66%)	79 (7%)	144 (12%)	181 (15%)	--	--
Community Resources							
Residential Buildings	2,357 Assets	2,128 (90%)	178 (8%)	28 (1%)	23 (1%)	--	--
Public & Commercial Buildings	186 Assets	174 (94%)	11 (6%)	1 (1%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	28 Assets	27 (96%)	1 (4%)	--	--	--	--
Health & Emergency Services	5 Assets	5 (100%)	--	--	--	--	--
Hazardous Material Sites	10 Assets	10 (100%)	--	--	--	--	--
Transportation Routes	33 Miles	32 (95%)	1 (4%)	0.2 (1%)	0.2 (<1%)	--	--
Evacuation Routes	3 Miles	3 (100%)	--	--	--	--	--
Natural Infrastructure							
Forests & Shrubland	211 Acres	13 (6%)	15 (7%)	74 (35%)	109 (52%)	--	--
Wetlands	58 Acres	10 (17%)	3 (6%)	23 (39%)	23 (39%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Palmyra Borough has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Palmyra Borough ranges from slightly drought-vulnerable to drought-vulnerable land. Nearly two-thirds of the land area in the Borough (61%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Palmyra Borough are concentrated in the east.

Figure 6.8.12 shows the spatial distribution of drought vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.8.12: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Palmyra Borough.

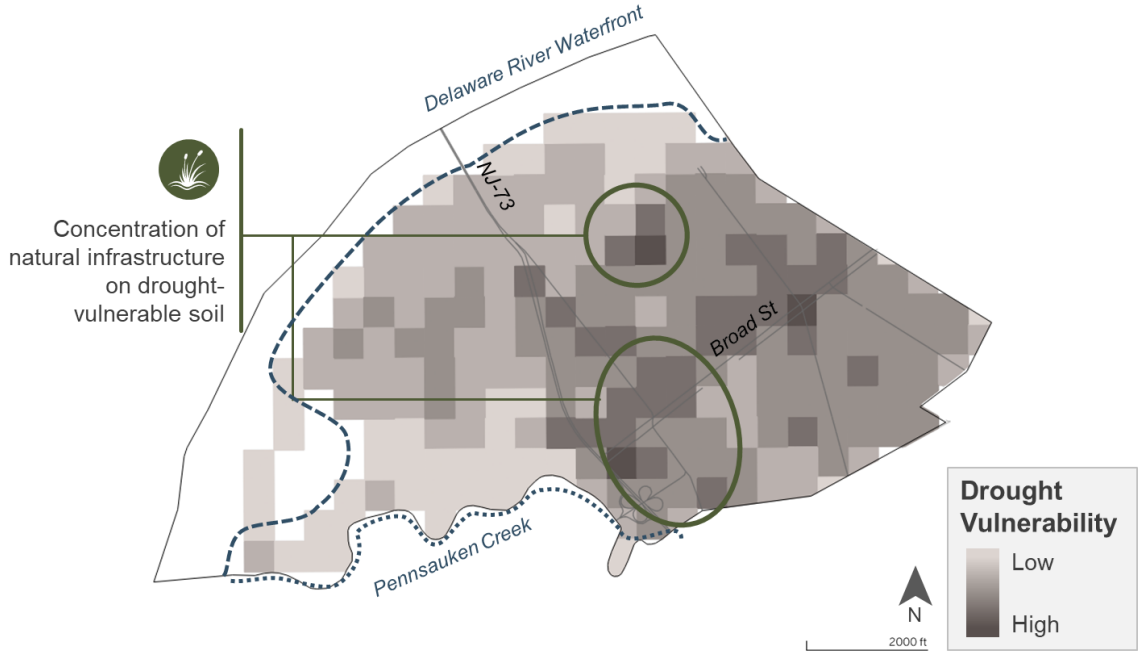
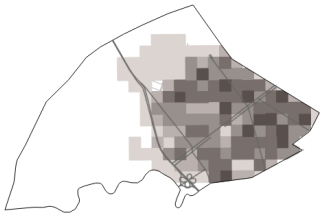
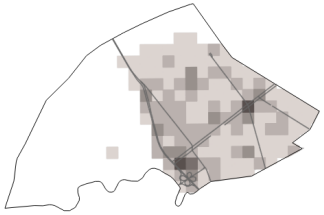


FIGURE 6.8.13: Drought exposure for four themes in Palmyra Borough.



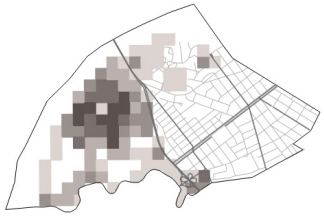
COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. That being said, there is no agricultural land in Palmyra Borough. The majority of buildings (95%) are also on land modeled to be drought-vulnerable, concentrated in the east. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



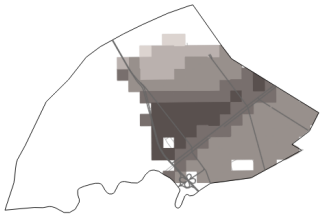
CRITICAL INFRASTRUCTURE

The majority of critical infrastructure assets in the Borough are on drought-sensitive soil. Between 80% and 82% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, concentrated in the center of the Borough and to the southeast. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Palmyra Borough, 9% of wetlands and 9% of forests and shrublands are modeled to have drought-vulnerable soil, in the center of the Borough extending towards the west.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the center of the Borough have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.8.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.8.7: Distribution of drought exposure scores for land area and assets in Palmyra Borough based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	1,171 Acres	2 (<1%)	4 (<1%)	111 (10%)	345 (29%)	709 (61%)
Community Resources						
Residential Buildings	2,357 Assets	--	--	--	98 (4%)	2,259 (96%)
Public & Commercial Buildings	186 Assets	--	--	2 (1%)	20 (11%)	164 (88%)
Critical Infrastructure						
Utility Infrastructure	28 Assets	1 (4%)	--	--	4 (14%)	23 (82%)
Health & Emergency Services	5 Assets	--	--	--	1 (20%)	4 (80%)
Hazardous Material Sites	10 Assets	--	--	1 (10%)	1 (10%)	8 (80%)
Transportation Routes	33 Miles	0.4 (1%)	--	--	5 (16%)	27 (83%)
Evacuation Routes	3 Miles	0.3 (11%)	--	--	1.2 (39%)	1.5 (50%)
Natural Infrastructure						
Forests & Shrubland	211 Acres	0.2 (<1%)	1 (<1%)	24 (11%)	167 (79%)	19 (9%)
Wetlands	58 Acres	0.3 (<1%)	3 (5%)	26 (44%)	24 (41%)	6 (9%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Palmyra Borough has a long history of incorporating environmental protection, and later, thinking about vulnerability, into its planning framework, particularly along its waterfront. Climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1992 Master Plan emphasizes the need to "preserve the wetlands and the floodways along streams, lakes, and rivers in a natural state" and to "prevent encroachment onto flood hazard areas." These objectives laid an early foundation for resilience and climate-related planning by prioritizing water quality and natural buffers. The 1992 Conservation Element proposes the creation of the Palmyra Coastal Conservation Area as a regional park, recommending land acquisition, access easements, and a use hierarchy to protect fragile ecosystems. The same plan highlights water pollution concerns, recommending a dumping ban within 500 feet of water bodies, a large-scale cleanup, and regular shoreline maintenance.
- The Borough continued these priorities in its 2001 Master Plan Reexamination, stressing that "development and redevelopment activities must be respectful of the environment and promote the preservation of green space."
- In March 2006, Palmyra Borough adopted its Municipal Stormwater Management Plan. The plan serves as a tool to control runoff, minimize flooding, and protect surface and groundwater quality in accordance with NJDEP standards.
- Chapter 126, Flood Damage Prevention, was adopted by the Borough of Palmyra on September 18, 2017, by Ordinance No. 2017-9. This chapter outlines the Borough's commitment to reducing flood-related risks through the regulation of development within designated flood hazard areas. It establishes the authority and responsibilities of the Floodplain Administrator, who ensures that proposed development complies with both the provisions of this chapter and applicable NJDEP standards to protect public safety and property.
- The Borough's 2018 Reexamination recommends the Borough "consider undergoing a coastal vulnerability assessment" to evaluate the implications of new FEMA flood maps on development, infrastructure, and insurance.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Palmyra Borough has a high hazard rating for

severe weather; medium ratings for disease outbreak, drought, extreme temperatures, and flood; and low ratings for dam failure, earthquake, severe winter weather, and wildfire. The Borough demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter weather; a moderate capacity in dealing with drought, earthquakes, floods, severe weather, and wildfires; and a weak capacity in dealing with dam failures.

STATE EFFORTS

- NJDEP's 2014 CVI found that there are significant moderate-risk areas throughout the Borough, with concentrations in the northern area adjacent to the Delaware River. The higher-risk areas are located adjacent to the Delaware River and Pennsauken Creek, in the northwestern, western, and southwestern portions of the Borough. There are no critical facilities in the municipality that are located in moderate- or higher-risk areas.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Palmyra Borough includes a blend of residential, commercial, institutional, and redevelopment-oriented zoning districts. Minimum lot sizes range from 5,000 square feet in the "NC" Neighborhood Commercial zone to 25,000 square feet in the "HC" Highway Commercial and "I" Industrial zones. Residential zoning is split between R-1 for single-family homes and R-2 for multifamily development, with minimum lot sizes of 7,500 square feet and 15,000 square feet, respectively. The Borough's Town Center zone (TC) permits modest-sized lots at 7,000 square feet, supporting compact development within the downtown core. Approximately one-fifth of Palmyra's developable land falls within its designated Redevelopment Zone (RD), which is excluded from buildout calculations due to its unique zoning and implementation framework. A discussion of the redevelopment areas is provided at the end of this section.

Palmyra is one of the few municipalities within the Study Area which carries density standards for specific zoning districts. This comes in the form of a Maximum Residential Density measured by Dwelling Units (DUs) per Acre. Those maximums and the zones for which they apply are included below. **Table 6.8.8** displays the zones and the square footage.

FIGURE 6.8.14: Waterfront view from Palmyra Cove Nature Park. (Source: Palmyra Borough)



TABLE 6.8.8: Palmyra Borough zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-1 (Residential Single-Family)	7,500 square feet (5.8 DU/Acre Maximum Residential Density)
R-2 (Residential Multifamily)	15,000 square feet
Commercial Zones' Minimum Lot Areas	
NC (Neighborhood Commercial)	5,000 square feet
TC (Town Center Commercial)	7,000 square feet
HC (Highway Commercial)	25,000 square feet
OC (Office Commercial)	Not included in dataset
Industrial Zones' Minimum Lot Areas	
I (Industrial)	25,000 square feet
Special or Excluded Zones	
P (Public and Institutional)	No minimum lot size; excluded from buildout
OS (Conservation and Open Space)	Not included in dataset
RD Zone (Redevelopment Zone)	Excluded due to nontraditional zoning and implementation; discussed at the end of this section

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as condominium ownership and the Borough's Redevelopment Zone, the amount of land available for new subdivision can be totaled. Palmyra Borough contains 3,178 parcels and/or land masses across all zoning districts which do not face those restrictions above and has an estimated 30,400,000 square feet (or 699 acres) of unconstrained land capable of a complete buildout.

Palmyra Borough's build-out analysis indicates limited remaining development capacity across most zoning districts, particularly within the residential zones, as shown in **Table 6.8.9**. Overall, Palmyra Borough can be characterized as effectively built out. When controlling for the condominium skew in the R-2 district, the Borough has limited capacity for expansion of new lots / residential dwellings based on the maximum permitted residential density in the R-1 Zone.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/ industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Borough prepares for increased climate risks and intensifying environmental

TABLE 6.8.9: Palmyra Borough buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*	MAX NO. OF DWELLING UNITS IN ZONE
R-1	39	175,598.49	4.03	7,500	23	23
R-1	1	10,598.75	0.24	7,500	1	1
R-1	944	7,268,451.07	166.86	7,500	969	967
R-1	1,111	8,781,969.23	201.61	7,500	1,171	1,169
R-2	790	4,661,903.07	107.02	130,680	36	--
NC	1	26,198.45	0.60	5,000	5	--
NC	4	99,211.30	2.28	5,000	20	--
NC	71	343,439.76	7.88	5,000	69	--
HC	47	619,313.16	14.22	25,000	25	--
TC	72	594,476.03	13.65	7,000	85	--
I	21	493,527.83	11.33	25,000	20	--
I	78	553,055.65	12.70	25,000	22	--

* *Maximum buildout hypothetical*

hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The city has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Borough has the following redevelopment areas noted.

- Along the South Side of Route 73 between the light rail tracks and the Palmyra Nature Cove. The Borough's redevelopment area (Tac-Pal) recently saw the construction of two large warehouse facilities and a 102-unit affordable housing development. As of November 2025, this development was in the completion stages. All

the development was constructed in accordance with the latest NJDEP stormwater requirements. Later phases of the project also include additional commercial and self-storage facilities and an auto dealership. These later phases are still in the design and permitting stages.

- The Borough has designated an area formerly occupied by industry in the area of Spring Garden St and Route 73 for the Round IV of Affordable Housing requirements.

ROUND IV OF AFFORDABLE HOUSING

The DCA determined the Round 4 Present Need as 2, and Prospective Need for Palmyra Borough as 31 units of affordable housing. Through Resolution 2025-77, the Borough challenged DCA's Prospective Need number, and through subsequent mediation with the Courts, the Round IV Prospective Need Obligation was reduced to 29. The Borough prepared an HEFSP outlining several mechanisms to address their Round IV Obligation, including using credits from Prior Rounds, and the Roto-Cylinders Redevelopment Area 100% affordable project. The Roto-Cylinders site consists of Block 78.01, Lots 4, 5, 5.01, 5.02, 5.03, 7 & 7.01 and is a roughly square parcel of 2.16 acres in the western portion of the Borough. The site currently consists of masonry structures, which previously served as offices, storage, and production facilities, as well as on-site parking. The project will consist of 22 affordable family rental units. This site was determined to be suitable, approvable, available, and developable in the HEFSP. There are no environmental constraints that encumber the site. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Resilience Strategy

Palmyra Borough's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Palmyra Borough.

> Palmyra Borough aims to promote sustainable and balanced growth. The Borough endeavors to protect environmentally sensitive areas along the Delaware River, such as the Palmyra Nature Cove, while enabling appropriate development and redevelopment, including vital mixed-use and affordable housing. Key goals include revitalizing the downtown business district, improving stormwater management to reduce flooding, and upgrading water and sewer infrastructure. Protecting natural resources, conserving energy, and preserving the Borough's historic character are priorities that support a resilient and vibrant community for current and future residents.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions

may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

PALMYRA BOROUGH RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.8.15: Chief Payton I. Fluornoy Memorial Park in Palmyra. *(Source: Mr. Matté, Wikimedia Commons, CC-BY-SA-4.0)*



PALMYRA BOROUGH RESILIENCE ACTION

Construct a Stormwater Surge Basin at the Public Works/Sewer Facility

The Temple Blvd/Firth Ln underground system provides underground storage during storm events, which is needed to prevent street flooding when the tide gates are closed, which occurs at high tide on the Delaware River. A surge basin will be added on the property that the Borough owns along Firth Ln to increase the storage volume available. The size of the basin is contingent upon the available area.

RESPONSIBLE PARTY	Palmyra Borough
ESTIMATED COSTS	$400K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

★★★★★

High

PALMYRA BOROUGH RESILIENCE ACTION

Temple/Firth Underground Drainage System Expansion

The Temple Blvd/Firth Ln underground system provides underground storage during storm events which is needed to prevent street flooding when the tide gates are closed which occurs at high tide on the Delaware River. An underground storage system was completed at Temple Blvd and Firth Ln intersection a few years ago and has improved the situation. The Borough is planning to increase the available underground storage systems capacity by constructing additional underground storage at the Berkley Ave Pump Station Site, located one block from the Firth Ave site.

RESPONSIBLE PARTY	Palmyra Borough
ESTIMATED COSTS	$100K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds



ESTIMATED TIMELINE

1 year

PRIORITY RATING

Medium

PALMYRA BOROUGH RESILIENCE ACTION

Garfield Ave Stormwater Outfall Tide Gate

Construct a tide gate at the Garfield Ave outfall to prevent storm surge from inundating the existing stormwater system. The existing 54-inch stormwater outfall at the end of Garfield Ave discharges to the Delaware River. At high tide, the river level surcharges the Borough's contributing storm system, promoting street flooding during rain events. To help offset this occurrence, a tide gate will be installed on this outfall.

RESPONSIBLE PARTY	Palmyra Borough
ESTIMATED COSTS	$50K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

PALMYRA BOROUGH RESILIENCE ACTION

Tacony Palmyra Bridge Tide Gate and Basin

Coordinate with the Burlington County Bridge Commission and facility manager at the Tacony Palmyra Bridge PD to construct a tide gate and basin for the Market St outfall system. This will provide storm storage during periods when the tide gate is closed, similar to the Firth Ln System described above. Since this is on Burlington County Bridge Commission property, the Borough would work in conjunction with the Bridge Commission who owns the property where the basin and tide gate can be constructed.

RESPONSIBLE PARTY	Palmyra Borough, Burlington County, BC Bridge Commission
ESTIMATED COSTS	$1M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, Grants, BC Bridge Commission



ESTIMATED TIMELINE

5-10 years

PRIORITY RATING

Medium

PALMYRA BOROUGH RESILIENCE ACTION

Public Works Flood Mitigation

The Borough will work to mitigate flood hazards to public works and sewer department infrastructure and equipment, including storage areas. Since the infrastructure cannot be raised, mitigation (hardening and sealing) will need to be completed around the outside of the property.

RESPONSIBLE PARTY Palmyra Borough

ESTIMATED COSTS $5M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, Grants



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

PALMYRA BOROUGH RESILIENCE ACTION

Property Acquisition

The Borough would look to acquire a couple homes at Firth Ln and Maryland Ave to expand the Firth Stormwater Basin in the future.

RESPONSIBLE PARTY Palmyra Borough

ESTIMATED COSTS $1M

POSSIBLE SOURCE(S) OF FUNDING Grants



ESTIMATED TIMELINE

10+ years

PRIORITY RATING

★ ☆ ☆ ☆ ☆

Low



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

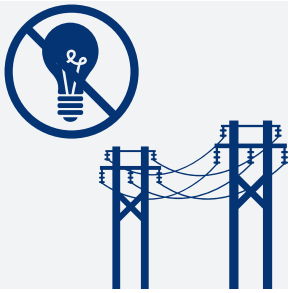


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



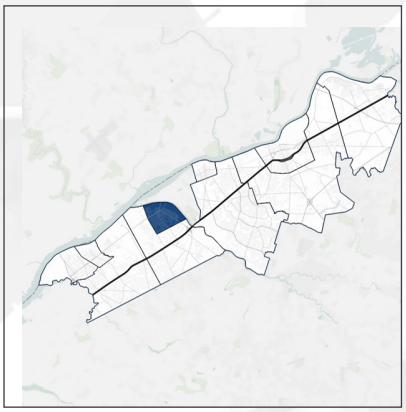
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.9: Riverside Township CCRHVA



Hospital
Municipal Building
School
Fire/EMS
Power Station

Summary of Vulnerabilities and Resilience Actions for Riverside Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Riverside Township and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Riverside Township can be found in the north along Rancocas Creek.



Sea Level Rise: Sea level rise is a growing concern for Riverside. The overall extent of sea level rise hazard exposure in the Township is moderate, and tidal inundation driven by sea level rise is concentrated in the north, along the Rancocas Creek.



Heat: Riverside Township has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Township can be found in the center of the Township, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Riverside has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Riverside is along the northern and southeastern borders.



Wildfire: Riverside has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. Wildfire potential in Riverside is highest along the north, which lines the banks of the Ranconcas Creek, and in the southeast.



Drought: Riverside Township has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Riverside Township ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Riverside Township's vulnerability assessment, and include:

- Riverbank Stabilization
- Improve Local Drainage and Stormwater Management Systems
- Physical and Programmatic Actions to Reduce Extreme Heat
- Mitigation of Sewage Treatment Plant
- Public Outreach and Education about Flood Mitigation
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Riverside Township (the Township), population 8,017, is surrounded by Delran Township to the south and west. The Township sits along the western bank of the Rancocas Creek. The Township is primarily residential with an eligible historic district centered around Scott St, the primary commercial corridor in the Township. Abutting the Rancocas Creek are wetland areas, open spaces, and trail areas, which act as a buffer to residential areas south of it. The Township is served by a River LINE light rail station. **Table 6.9.1** shows socially vulnerable populations in Riverside Township. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.9.1: Socially vulnerable populations in Riverside Township.

DEMOGRAPHIC VARIABLE	RIVERSIDE TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	8,017	--	9,267,014	--
Total Household Units	3,327	--	3,775,842	--
Occupied Housing Units	3,034	--	3,478,355	--
Vacant Housing Units	293	--	297,487	--
Population 18 or Younger	1,431	17.80%	2,031,322	21.90%
Population 65 or Older	1,104	13.77%	1,559,816	16.83%
Population with a disability	1,040	**13.00%**	975,308	10.60%
Persons without a high school diploma	845	**14.82%**	600,736	9.30%

DEMOGRAPHIC VARIABLE	RIVERSIDE TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons below poverty level	1,959	**24.49%**	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	8.30%	N/A*	6.20%
Persons uninsured	1,319	**16.50%**	682,266	7.40%
Persons who speak English "less than well"	594	7.70%	562,865	6.44%
Single Parent households	204	**6.72%**	198,943	5.72%
Minority Ethnicity (non-white)	3,246	40.49%	4,453,673	48.06%
Mobile homes	35	1.10%	35,303	0.90%
Housing with 10 or more units	210	6.31%	639,960	16.95%
Crowded housing units	87	2.87%	129,710	3.73%
Households with no vehicle	293	9.70%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Borough of Palmyra, Borough of Riverton, Cinnaminson Township, Delran Township, and Riverside Township took place on April 24th, 2025, from 6:30 to 8:30 p.m. Approximately 35 stakeholders attended the meeting, including the mayors of Delran, Borough of Riverton, and Riverside, and council members. Three attendees were affiliated with Riverside Township. Attendees from Riverside were primarily concerned with issues of flooding attributed to a lack of long-term planning and discharge points in the community. Streets and bridges have been identified as problem areas in Riverside, particularly the Riverside-Delanco Bridge. Respondents indicated that their most valuable community assets are municipal buildings, the police department, and public education facilities.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the

public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

No attendees were from Riverside Township, and no questions/comments or poll results about Riverside Township were received during this meeting.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Riverside and Delran in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Riverside.

Tar Kiln Run was mentioned as a problem area for flooding in Riverside, and ongoing efforts to improve water flow in this area were noted.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed and the information needed for the development of all actions were discussed. Potential resilience actions were discussed, and the information needed for the development of all actions was discussed. The draft policy statements were also reviewed.

The Riverside representative noted that the municipality works with counterparts in Delran to address common issues. Following Delran's example, Riverside has been in conversations with the USACE.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were

to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them, and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Riverside Township representatives noted that all regional resilience actions mentioned (continuation of road maintenance to respond to climate change impacts, stream clearing, bank stabilization, channel restoration, and coordinated response to widespread power outages) were important and confirmed their interest in these actions for their community. Riverside Township discussed potential resilience actions that address flooding and heat, such as bank stabilization, retrofitting for resilience of the sewage treatment plant, drainage improvements along roadways, and residential education programs on flood mitigation. The representatives were interested in many different kinds of cooling strategies, including adding tree canopy.

Map and Survey Comments

The Project Team received 19 points of information for Riverside Township, noting problem areas, assets, climate concerns, and resilience visioning. Flooding was a common theme. Erosion, structural enhancements, and vulnerability were also noted. Commenters envisioned a future that includes resources and knowledge to aid communities, and the ability to come back quickly from a setback.

MAP COMMENTS

- Erosion was noted at the **Public Works Garage.**
- Flooding was noted at **2nd St, Hooker St, Jefferson St and American Legion, N. Fairview and Polk street, North Pavilion Ave, Pulaski Ave and Monroe St, River Dr,** and **Weeks Ave and Washington St.**

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

RESILIENCE VISIONING COMMENTS

What concerns do you have about how climate change may affect your community?

I am concerned about the impact of flooding from the rivers and storms. During a heavy or even moderate rain, the bridge connecting us to Delanco often floods. The northern end of Chester Ave floods as well as South Chester Ave near the railroad tracks.

What resources are available to help us identify and remediate our areas of concern? Also, are there areas that are vulnerable to aspects of climate change that we aren't even considering at this time but should?

Imagine a future 50 years away. What do you hope to see in Burlington County?

I hope to see a Burlington County that is working with an ever-changing world. A place where we remember the beauty of our county but also have resources in place to keep it thriving.

What does a resilient Burlington County look like to you?

A resilient Burlington County is one where we have the resources in place to help and community in need of support. This could include having a designated response team to any climate change disaster - fire departments, EMTs, and police are the obvious choices. However, we also need to work together to identify the most vulnerable areas and have team created to respond to any town. People with the knowledge to direct efforts for recovery. Also, plans for displaced persons, easy assistance for those who need it, and plans for schools. We also need to know what government programs are in place that can provide monetary assistance to those who need it.

Flooding

Flooding is a significant area of concern for residents and community leaders in Riverside Township and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Riverside Township is in the north along Rancocas Creek. These areas represent 33% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. Nearly half of the Township (44%) is within a modeled floodplain used in this analysis.

Figure 6.9.1 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.9.1: Flood vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.

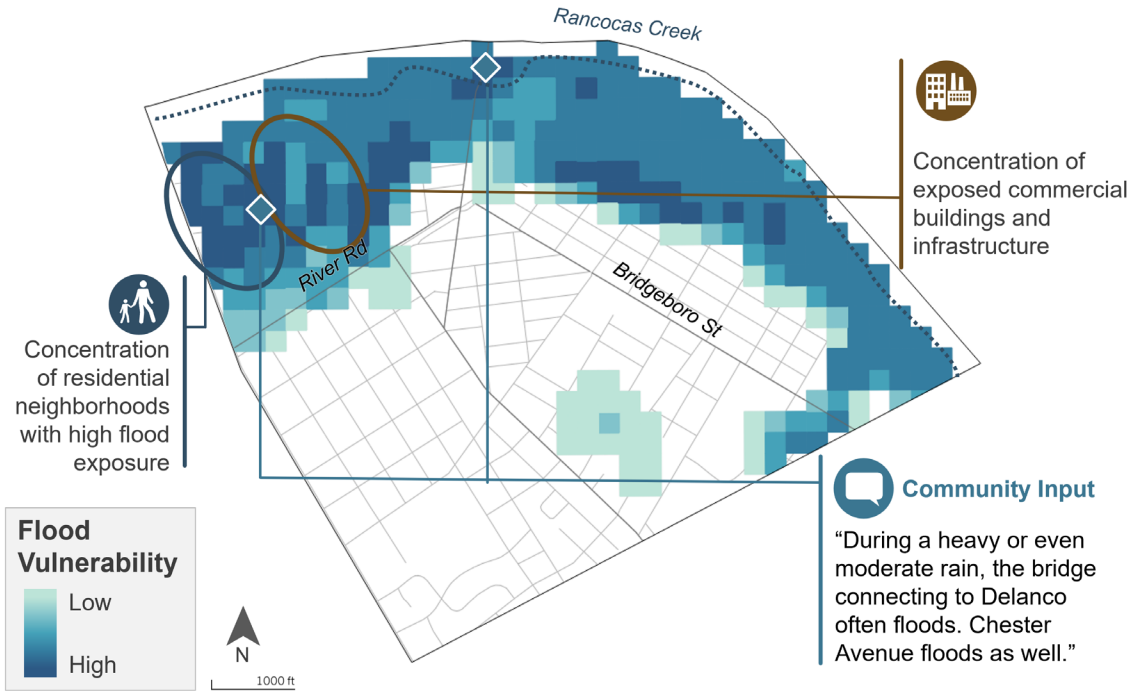


FIGURE 6.9.2: Flood exposure for four themes in Riverside Township.



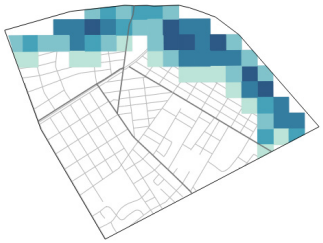
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Riverside Township, approximately 7%, or 174, of the 2,624 residential buildings in the Township are classified as having high flood exposure (within a 1% annual chance floodplain today), and 19%, or 42, of the 227 public and commercial buildings have high exposure, concentrated in the northwest nearby Rancocas Creek. A notable flood-exposed building is American Legion.



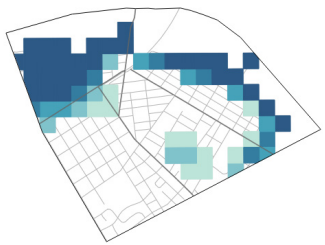
CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Riverside Township, 86% of utility infrastructure has a high exposure to flooding, all of which are communication towers. Additionally, Riverside Commercial Park and Riverside Metals Corp are hazardous material sites with flood exposure, where flooding can lead to material releases that can pose public health concerns and environmental damage. Four miles of transportation routes in the Township also have high flood exposure. Harrison St has the highest mileage exposed among roadways, with 0.6 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Riverside Township, 24 acres, or 61%, of forests and shrublands in the Township are exposed to high levels of flooding, in the north along Rancocas Creek. Similarly, 94% of wildlife habitat areas and 100% of wetlands are also within high flood exposure areas, in the north along Rancocas Creek, but wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the north have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding from Rancocas Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.9.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.9.2: Distribution of flood exposure scores for land area and assets in Riverside Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	936 Acres	527 (56%)	56 (6%)	43 (5%)	309 (33%)
Community Resources					
Residential Buildings	2,624 Assets	2,218 (85%)	71 (3%)	161 (6%)	174 (7%)
Public & Commercial Buildings	227 Assets	168 (74%)	10 (4%)	7 (3%)	42 (19%)
Critical Infrastructure					
Utility Infrastructure	7 Assets	1 (14%)	--	--	6 (86%)
Health & Emergency Services	2 Assets	2 (100%)	--	--	--
Hazardous Material Sites	6 Assets	1 (17%)	1 (17%)	2 (33%)	2 (33%)
Transportation Routes	30 Miles	22 (75%)	2 (6%)	2 (6%)	4 (14%)
Natural Infrastructure					
Forests & Shrubland	40 Acres	12 (31%)	--	3 (8%)	24 (61%)
Wildlife Habitat Areas	307 Acres	4 (1%)	3 (1%)	12 (4%)	287 (94%)
Wetlands	124 Acres	--	--	--	124 (100%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a growing concern for Riverside. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Rancocas Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

FIGURE 6.9.3: Sea level rise vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.



Tidal inundation driven by sea level rise is concentrated in the north as it lines the Rancocas Creek. Across the Township, 159 acres, or 17%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is moderate, as a majority of the affected land is vulnerable in current conditions. Around the end of the century, 29% of the land area in the Township may be exposed to tidal inundation with five feet of sea level rise.

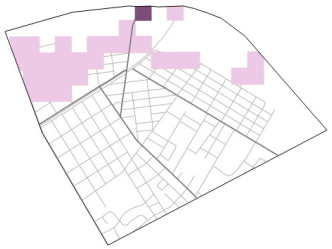
Figure 6.9.3 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.9.4: Sea level rise exposure for four themes in Riverside Township.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Riverside, eight homes and 13 public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and 80 and 30, respectively, would be exposed at five feet. These buildings are concentrated in the northwest corner and include American Legion, a community center.



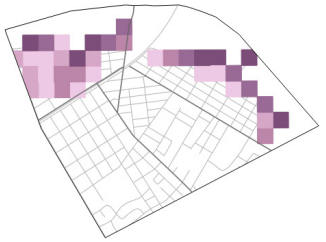
CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Riverside, eight critical infrastructure assets and three miles of roadway are exposed to 4-5 feet of tidal inundation. This includes River Dr. and Whittaker St.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. Wetlands are known to migrate inland with rising sea levels, if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. All 124 acres of wetlands in the Township are exposed to 4-5 feet of tidal inundation, concentrated on the northern border of the Township. Similarly, 60% of forests and shrublands, and 91% of wildlife habitat areas are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the north of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.9.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed.

TABLE 6.9.3: Distribution of sea level rise exposure scores for land area and assets in Riverside Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	936 Acres	662 (71%)	23 (2%)	34 (4%)	21 (2%)	25 (3%)	14 (1%)	159 (17%)
Community Resources								
Residential Buildings	2,624 Assets	2,544 (97%)	57 (2%)	15 (1%)	7 (<1%)	1 (<1%)	--	--
Public & Commercial Buildings	227 Assets	197 (87%)	10 (4%)	7 (3%)	9 (4%)	4 (2%)	--	--
Critical Infrastructure								
Utility Infrastructure	7 Assets	1 (14%)	--	--	4 (57%)	1 (14%)	--	1 (14%)
Health & Emergency Services	2 Assets	2 (100%)	--	--	--	--	--	--
Hazardous Material Sites	6 Assets	4 (67%)	1 (17%)	--	--	--	--	1 (17%)
Transportation Routes	30 Miles	27 (91%)	1 (3%)	1 (4%)	0.4 (1%)	0.3 (1%)	--	0.1 (<1%)
Natural Infrastructure								
Forests & Shrubland	40 Acres	16 (40%)	0.6 (2%)	--	1 (1%)	2 (5%)	3 (7%)	18 (45%)
Wildlife Habitat Areas	307 Acres	29 (9%)	6 (2%)	6 (2%)	5 (2%)	14 (4%)	7 (2%)	241 (79%)
Wetlands	124 Acres	--	--	--	--	--	2 (2%)	122 (98%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Riverside Township has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township can be found in the center of the Township. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 15% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 13% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.9.5 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.9.5: Heat vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.

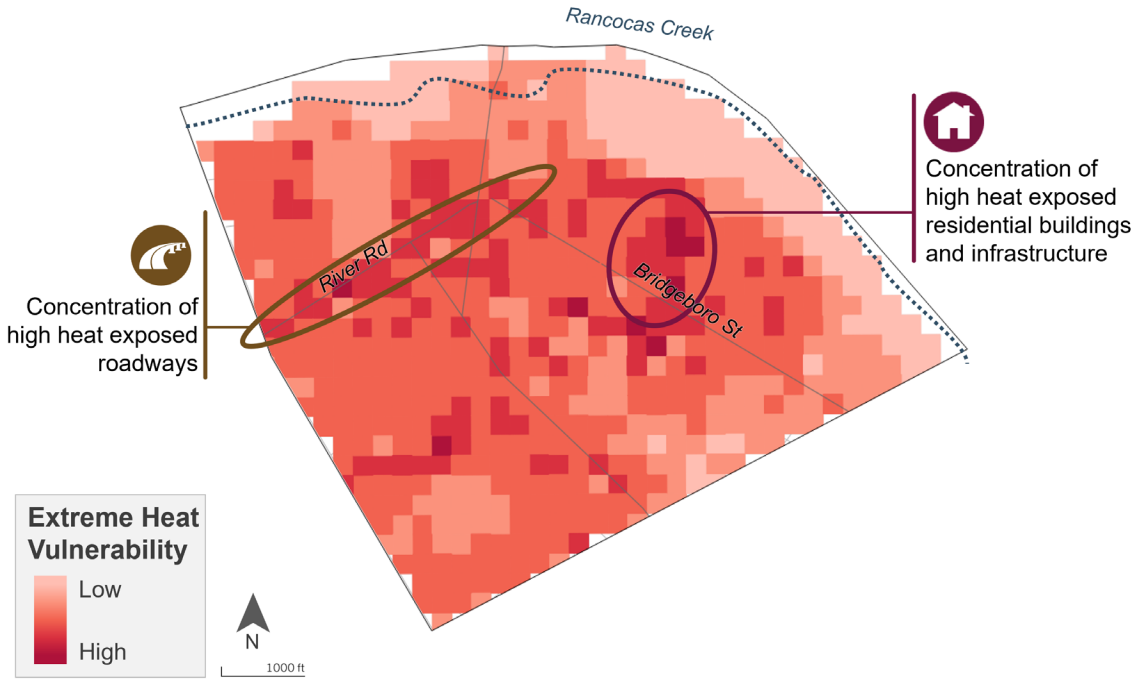
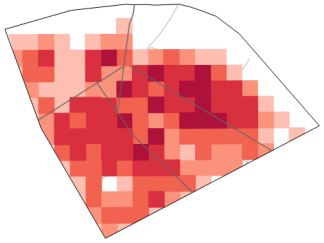
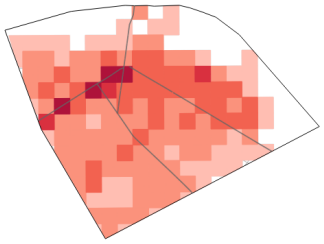


FIGURE 6.9.6: Heat exposure for four themes in Riverside Township.



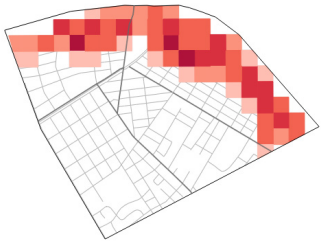
COMMUNITY RESOURCES

In Riverside Township, 10% of residential buildings and 33% of public and commercial buildings have at least moderate-high heat exposure throughout the central portion of the Township. One public or commercial building has particularly high measured heat exposure, Riverside High School. While these buildings are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



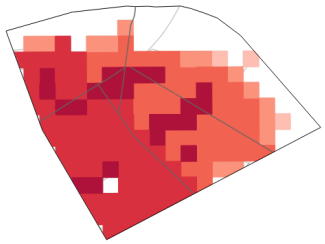
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. All health and emergency services facilities, 50% of hazardous material sites, and 28% of transportation routes in the Township have at least moderate-high heat exposure, concentrated in the northwest. While many critical infrastructure assets are designed to not be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Riverside Township, 72% of forests and shrublands, 99% of wetlands, and 88% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are in the north along Rancocas Creek.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the center and south of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.9.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.9.4: Distribution of heat exposure scores for land area and assets in Riverside Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	936 Acres	120 (13%)	84 (9%)	599 (64%)	128 (14%)	6 (1%)
Community Resources						
Residential Buildings	2,624 Assets	2 (<1%)	87 (3%)	2,261 (86%)	267 (10%)	7 (<1%)
Public & Commercial Buildings	227 Assets	--	9 (4%)	142 (63%)	75 (33%)	1 (<1%)
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	3 (43%)	4 (57%)	--	--
Health & Emergency Services	2 Assets	--	--	--	2 (100%)	--
Hazardous Material Sites	6 Assets	--	1 (17%)	2 (33%)	3 (50%)	--
Transportation Routes	30 Miles	0.1 (<1%)	1 (3%)	21 (69%)	8 (27%)	0.2 (1%)
Natural Infrastructure						
Forests & Shrubland	40 Acres	10 (24%)	19 (48%)	11 (28%)	--	--
Wildlife Habitat Areas	307 Acres	203 (66%)	67 (22%)	36 (12%)	0.1 (<1%)	--
Wetlands	124 Acres	105 (85%)	18 (14%)	1 (1%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Riverside has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Riverside is along the northern and southeastern borders. Overall, 11% of the land area in the Township is considered exposed to landslides.

Figure 6.9.7 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.9.7: Landslide vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.

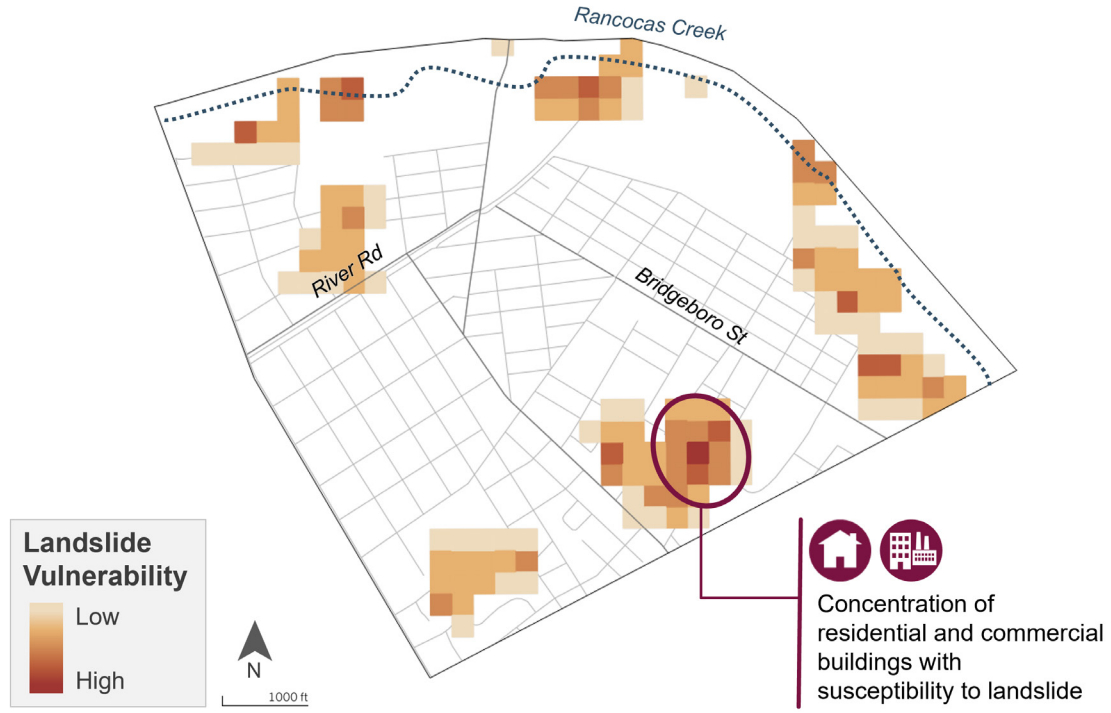
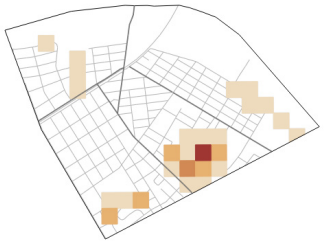
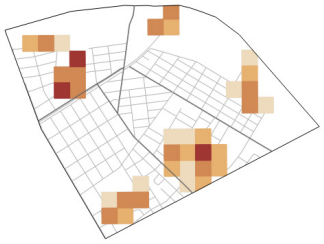


FIGURE 6.9.8: Landslide exposure for four themes in Riverside Township.



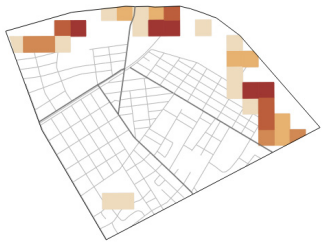
COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 5% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure. No buildings are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated along the southeast.



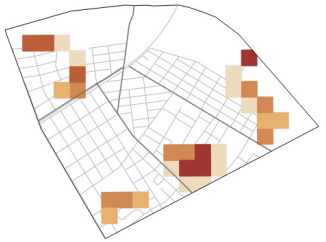
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include a land mobile private tower. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are River Dr and Whittaker St.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion, but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 36 acres, or 22%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure. No forests, shrublands, or wetlands have moderate to high exposure. Around 81 acres, or 26%, of wildlife habitat areas are also known to have landslide exposure. These areas are centered along the northern border.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure that communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the east have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include the north.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.9.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.9.5: Distribution of landslide exposure scores for land area and assets in Riverside Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	936 Acres	829 (89%)	87 (9%)	20 (2%)	--	--	--
Community Resources							
Residential Buildings	2,624 Assets	2,508 (96%)	113 (4%)	3 (<1%)	--	--	--
Public & Commercial Buildings	227 Assets	206 (91%)	17 (7%)	4 (2%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	6 (86%)	1 (14%)	--	--	--	--
Health & Emergency Services	2 Assets	2 (100%)	--	--	--	--	--
Hazardous Material Sites	6 Assets	6 (100%)	--	--	--	--	--
Transportation Routes	30 Miles	27 (91%)	3 (9%)	0.1 (<1%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	40 Acres	23 (59%)	12 (29%)	4 (11%)	--	--	--
Wildlife Habitat Areas	307 Acres	225 (74%)	50 (16%)	31 (10%)	--	--	--
Wetlands	124 Acres	104 (84%)	17 (14%)	3 (2%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Riverside has an overall very low risk of wildfire compared to other hazards, but developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Riverside is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if the infrastructure in Riverside is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Riverside is highest along the north, which lines the banks of the Ranconcas Creek, and in the southeast. These areas of relatively higher wildfire hazard potential are mostly wildlife habitat areas with some areas of forest and wetlands. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Zero of land area in the Township has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.9.9: Wildfire vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.

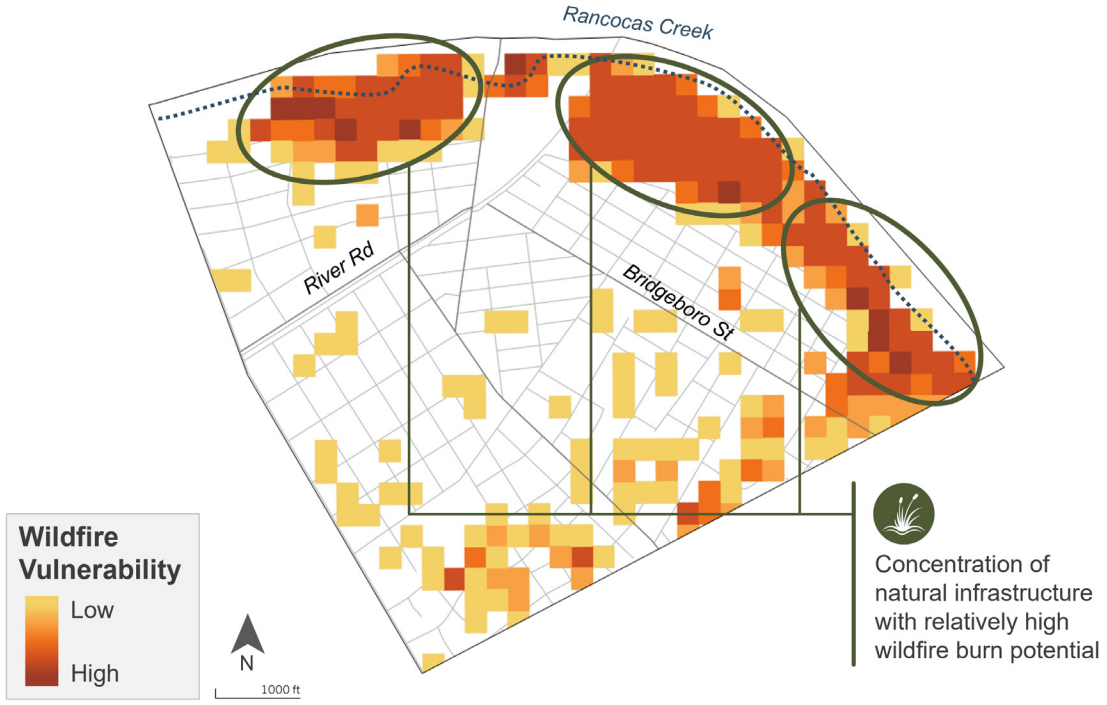


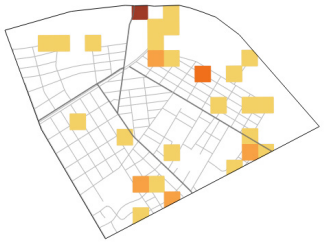
Figure 6.9.9 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.9.10: Wildfire exposure for four themes in Riverside Township.



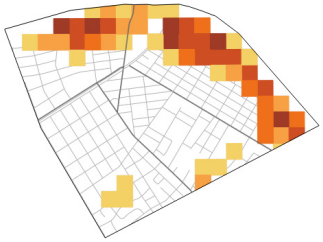
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Riverside are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure. Areas with higher density urban development, meanwhile, have lower exposure. All of the buildings in the Township have an annual likelihood of burning of less than 0.03%.



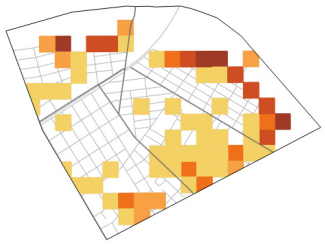
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Roadways in more wildfire-prone areas include Harrison St, Monroe St, and Polk St. Although roads are less likely to be directly damaged by fire, they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands in the north and southeast, and wetlands centralized in the north, have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Riverside communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires in surrounding areas can still cause harm to Riverside residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the north, especially along the Ranconcas Creek have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.9.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.9.6: Distribution of heat exposure scores for land area and assets in Riverside Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	936 Acres	727 (78%)	19 (2%)	190 (20%)	--	--	--
Community Resources							
Residential Buildings	2,624 Assets	2,518 (96%)	34 (1%)	72 (3%)	--	--	--
Public & Commercial Buildings	227 Assets	219 (96%)	2 (1%)	6 (3%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	7 Assets	6 (86%)	--	1 (14%)	--	--	--
Health & Emergency Services	2 Assets	2 (100%)	--	--	--	--	--
Hazardous Material Sites	6 Assets	6 (100%)	--	--	--	--	--
Transportation Routes	30 Miles	29 (96%)	0.1 (<1%)	1 (4%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	40 Acres	9 (22%)	1 (3%)	29 (74%)	--	--	--
Wildlife Habitat Areas	307 Acres	143 (47%)	--	164 (53%)	--	--	--
Wetlands	124 Acres	9 (7%)	--	115 (93%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Riverside Township has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

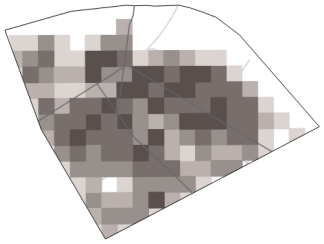
Most of the land in Riverside Township ranges from slightly drought-vulnerable to drought-vulnerable land. The majority of the land area in the Township (88%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Riverside Township are distributed throughout the Township.

Figure 6.9.11 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.9.11: Drought vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverside Township.

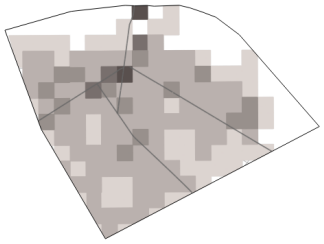


FIGURE 6.9.12: Drought exposure for four themes in Riverside Township.



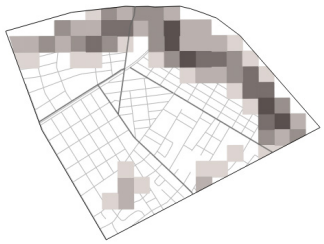
COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. That being said, there is no agricultural land in Riverside Township. Almost all buildings (99%) are also on land modeled to be drought-vulnerable, spread throughout the Township. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



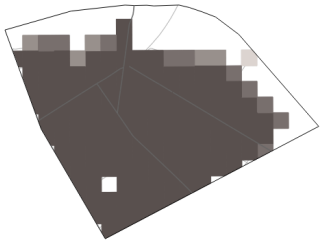
CRITICAL INFRASTRUCTURE

All critical infrastructure assets in the Township are on drought-sensitive soil. 100% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, spread throughout the Township. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Riverside Township, 31% of wetlands and 73% of forests and shrublands are modeled to have drought-vulnerable soil, concentrated in the north.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts throughout the Township have high rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.9.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.9.7: Distribution of drought exposure scores for land area and assets in Riverside Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	936 Acres	0.3 (<1%)	85 (9%)	12 (1%)	12 (1%)	826 (88%)
Community Resources						
Residential Buildings	2,624 Assets	--	--	--	9 (<1%)	2,615 (99%)
Public & Commercial Buildings	227 Assets	--	--	5 (2%)	1 (<1%)	221 (97%)
Critical Infrastructure						
Utility Infrastructure	7 Assets	--	--	--	--	7 (100%)
Health & Emergency Services	2 Assets	--	--	--	--	2 (100%)
Hazardous Material Sites	6 Assets	--	--	--	--	6 (100%)
Transportation Routes	30 Miles	--	0.1 (<1%)	--	0.1 (<1%)	29 (99%)
Evacuation Routes	3 Miles	0.3 (11%)	--	--	1.2 (39%)	1.5 (50%)
Natural Infrastructure						
Forests & Shrubland	40 Acres	0.1 (<1%)	0.1 (<1%)	9 (21%)	2 (5%)	29 (73%)
Wildlife Habitat Areas	307 Acres	43 (14%)	105 (34%)	20 (6%)	8 (2%)	132 (43%)
Wetlands	124 Acres	--	82 (67%)	--	3 (2%)	38 (31%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Riverside Township has integrated climate change-related policies into its master planning efforts by focusing on conservation, stormwater management, and sustainability. Climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1978 Master Plan emphasizes the need to promote conservation of the natural setting and environmental amenities, which became a recurring theme in subsequent plans.
- The 1996 Master Plan Reexamination reaffirms these goals and adds the promotion of the waterfront as a major recreational feature and prioritizes remediation of brownfield sites. In the 1997 Land Use Plan, key strategies are laid out to capitalize on the Rancocas Creek and Delaware River, enhance park and open space utilization, and protect environmentally sensitive areas like wetlands and floodplains.
- The 2003 Master Plan Reexamination proposes a Stormwater Plan element, anticipating state regulations.
- The Riverside Township Municipal Stormwater Management Plan was adopted in April 2005 to meet NJDEP regulatory standards. The plan addresses runoff quantity, water quality, and recharge through structural and non-structural best practices. It was revised in July 2006.
- In the 2007 Downtown Strategic Plan, Riverside takes steps to comply with new stormwater regulations, incorporating measures to minimize runoff into Rancocas Creek and handle stormwater on-site.
- The 2013 Land Use Plan, dubbed the "2025 Land Use Plan" as it aimed to plan for the year 2025, adds a focus on alternative transportation and expanded conservation and recreation areas, with an emphasis on waterfront walkways.
- Chapter 225, Flood Damage Prevention, amended in its entirety on October 16, 2017, by Ordinance No. 2017-08, reaffirms Riverside Township's dedication to reducing risks associated with flooding. This chapter defines procedures for regulating development in flood-prone areas and codifies the role of the Floodplain Administrator. The Administrator is responsible for interpreting ordinance provisions and ensuring alignment with NJDEP regulations and local planning policies to safeguard the general welfare.
- The 2022 Master Plan Reexamination recommends adopting stormwater, floodplain, and water conservation ordinances to reduce flooding and enhance resilience. The plan also recommended exploring electric vehicle charging stations to align with statewide sustainability efforts.

FIGURE 6.9.13: Street festival in Riverside Township. *(Source: Riverside Township)*



COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, the Township of Riverside has a high hazard rating for severe weather; medium ratings for disease outbreak, extreme temperatures, flood, and severe winter weather; and low ratings for dam failure, drought, earthquake, and wildfire. The Township demonstrates a strong adaptive capacity in dealing with disease outbreak, extreme temperatures, and severe winter weather; and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVI found that the areas in Riverside categorized as highest-risk are located in the northern area of the Township, adjacent to the Rancocas Creek. Moderate-risk areas act as a buffer between the highest-risk areas adjacent to the Creek and the lower-risk areas found in the central and southern portions of the Township. There are no critical facilities in the municipality that are located in moderate- or higher-risk areas.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Riverside Township contains a mix of residential, commercial, industrial, and special development zoning districts with minimum lot sizes ranging from 4,000 square feet in the R-3 and Special Development zones to 43,560 square feet (1 acre) in the I-2 Commercial Industrial district. Residential zones are organized into three main categories (R-1 through R-3), each reflecting progressively smaller minimum lot areas, with R-3 accommodating the densest form of residential development at 4,000 square feet. The Township's two commercial zones allow lots as small as 5,000 square feet and support

TABLE 6.9.8: Riverside Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-3 (Residential – 3)	4,000 square feet
R-2 (Residential – 2)	5,000 square feet
R-1 (Residential – 1)	6,000 square feet
Special Development Zones' Minimum Lot Area	
SD-1 through SD-4 (Special Development – grouped as SD in dataset)	4,000 square feet
Commercial Zones' Minimum Lot Areas	
C-1 (Commercial District)	5,000 square feet
C-2 (Commercial District)	5,000 square feet
Industrial Zones' Minimum Lot Areas	
I-1 (General Industrial – 1)	6,000 square feet
I-2 (Commercial Industrial – 2)	43,560 square feet (1 acre)
Environmental and Overlay Zones	
FH-C (Flood Hazard Conservation)*	9,000 square feet

* *While included in the buildout calculations, the FH-C zone is intended to protect flood-prone areas. If developed at all, it would not support dense or structural development and will likely remain as passive open space or recreational land.*

small-scale development patterns. Industrial zones vary significantly in intensity, with the I-1 General Industrial district having a small minimum lot size of 6,000 square feet and I-2 requiring full-acre parcels. **Table 6.9.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns, such as special development districts and small-lot zoning, the amount of land available for new subdivision can be totaled. Riverside Township contains 2,735 parcels and/or land masses across all zoning districts, which do not face those restrictions above, and has an estimated 21,555,027 square feet (or 494.84 acres) of unconstrained land capable of a complete buildout. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating theoretical buildout capacity using the zones' minimum lot area requirements.

Of the residential districts, the buildout analysis for Riverside Township identifies the R-1 and R-3 residential districts as having the most remaining development capacity, as shown in **Table 6.9.9**. The R-3 zone comprises three areas that could accommodate a combined total of 280 additional lots under current zoning standards. However, the area adjacent

TABLE 6.9.9: Riverside Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
C-1	9	49,550.61	1.14	5,000	9.91
C-2	138	709,359.09	16.28	5,000	141.87
FH-C	12	128,464.45	2.95	9,000	14.27
FH-C	1	3,490.02	0.08	9,000	0.39
I-1	2	796,738.30	18.29	6,000	132.79
I-2	33	1,344,992.15	30.88	43,560	30.88
R-1	649	6,928,800.73	159.06	6,000	1,154.80
R-1	150	1,298,539.69	29.81	6,000	216.42
R-2	488	3,218,293.91	73.88	5,000	643.66
R-2	150	803,462.78	18.44	5,000	160.69
R-3	637	3,583,614.08	82.27	4,000	895.90
R-3	233	911,770.91	20.93	4,000	227.94
R-3	164	760,788.96	17.47	4,000	190.20
SD	69	1,017,161.20	23.35	4,000	254.29

* *Maximum buildout hypothetical*

to Delran Township accounts for almost all of this increase, with an increase of 258.9. These calculations reflect the small minimum lot area requirements across the Township and are largely concentrated within residential districts; however, these calculations may be skewed due to how small the minimum lot area requirements are in the zones.

The C-1 and C-2 commercial zones are effectively built out, with minimal remaining capacity. The C-1 district currently contains nine lots, with zoning permitting just under ten. The C-2 district has 138 existing lots and a theoretical capacity of 141.87, indicating close alignment between current land use and zoning allowances.

No zoning districts appear to be significantly overbuilt using the standard methodology, which is consistent with Riverside's compact footprint and relatively high density.

Riverside Township's small geographic area, combined with its historic downtown and consistently small minimum lot sizes, suggests that the buildout projections are highly theoretical. The apparent capacity for 1,339 additional lots across all zoning districts is unlikely to materialize due to existing urban development patterns

and limited physical opportunities for subdivision or infill.

Note the results of this analysis further likely skew towards an overestimation of redevelopment potential in commercial/industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The Township has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The two developments moving ahead on the Township's Golden Triangle Development Area are noted below. The Golden Triangle Development area is partly in a flood-prone area bound by the North Pavilion and train tracks. The footprint has been shrunk due to its proximity to the marsh.

- The Keystone Watch Case Building is a residential development and is approved for approximately 64 units. It is a conversion of an existing six-story building to apartments with the construction of a rear parking lot and a community center.
- The Camelot development is a residential development and approved for 150 units. This includes new construction of apartment buildings and parking lots, along with a community center.

ROUND IV OF AFFORDABLE HOUSING

The DCA determined the Round 4 Present Need as 126, and Prospective Need for Riverside Township as 18 units of affordable housing. Through Resolution 2025 #43, the Township accepted DCA's number. The Township prepared an HEFSP outlining two mechanisms that will satisfy the Round IV Obligation, including a 100% affordable housing development and inclusionary zoning. The Township Planning Board adopted the HEFSP through Resolution 2025-8, and the Governing Body endorsed the HEFSP through Resolution 2025-#107.

The 100% affordable housing development is located in the St. Peter's Redevelopment Area. The site is roughly a triangular parcel of 2.2 acres, consisting of Block 1401 and 905, Lots 1, 1.01, 1.02, 1.03, and 5. It is located in the central portion of the Township and is occupied by a church and school building, which are proposed to be demolished. The proposed development will consist of 61 affordable family rental units. This site was determined to be suitable, approvable, available, and developable in the HEFSP. There are no environmental constraints that encumber the site. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals,

including NJDEP approval, will be sought where and when appropriate.

The proposed inclusionary development is known as the Golden Triangle site, located in the northern portion of the municipality. The total number of affordable units has not been determined. This site was determined to be suitable, approvable, available, and developable in the HEFSP. There are 100-year flood hazard areas that encumber the site. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Resilience Strategy

Riverside Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Riverside Township.

> Riverside Township's goal is to enhance quality of life by preserving its small-town identity and heritage while supporting thoughtful growth. The Township will balance preservation with revitalization to create a resilient community where residents, businesses, and organizations can thrive having mitigated concerns of flooding or other extreme weather hazards that currently challenge revitalization efforts. Protecting natural resources and promoting sustainable development are key goals to ensure Riverside remains a vibrant and welcoming place through future generations.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

RIVERSIDE TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.

- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.9.14: View of the Riverside Township municipal building from West Scott St. (Source: Mr. Matté, Wikimedia Commons, CC BY-SA 4.0)



RIVERSIDE TOWNSHIP RESILIENCE ACTION

Riverbank Stabilization

Implement riverbank stabilization measures to reduce erosion for shorelines near the Riverside Park area. This may include reinforcing eroding riverbanks with native vegetation, riprap, or engineered retaining structures to avoid the risk of landslides. Stabilized banks prevent further erosion, protect nearby properties, and reduce sedimentation in waterways. Vegetated solutions also improve water quality and habitat conditions. For private properties, programs may be set up to support and incentivize action on private land.

RESPONSIBLE PARTY	Riverside Township, NJDEP, USACE
ESTIMATED COSTS	$100K - $5M+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

★★★★★

High



RIVERSIDE TOWNSHIP RESILIENCE ACTION

Improve Local Drainage and Stormwater Management Systems

During periods of high water in nearby waterways, the community's drainage systems become blocked, preventing stormwater from discharging properly. This causes stormwater backup in streets such as North Chester, North Fairview, and North Pavilion, leading to localized flooding along the roadway. The town seeks to implement drainage infrastructure improvements and stormwater management best practices to increase local storage and infiltration capacity, reduce peak flows, and improve the overall performance of the drainage network. These can include green infrastructure and nature-based solutions where possible.

RESPONSIBLE PARTY	Riverside Township
ESTIMATED COSTS	$100K - $1M
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-10 years

PRIORITY RATING

★★★★★

High

RIVERSIDE TOWNSHIP RESILIENCE ACTION

Physical and Programmatic Actions to Reduce Extreme Heat

Physical actions, such as expanding the tree canopy, and programmatic actions, such as public heat resilience education, can be implemented to reduce impacts from Extreme Heat. Potential actions may include cool roof installations and cool pavement coatings, which use reflective materials to reduce heat absorption. Also, expansion of the tree canopy and shade structures in high heat areas can improve shade and reduce the heat island effect. Tree planting on both public and private properties can be promoted through incentive programs, volunteer planting events, and homeowner education. Tree planting would need to consider trip and fall hazards as well as proper tree species. Finally, heat emergency operations planning and public education can help reduce the impacts of an extreme heat event, and may include establishing cooling centers and developing outreach programs to empower residents to protect themselves.

RESPONSIBLE PARTY	Riverside Township
ESTIMATED COSTS	$50K - $250K+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★★★

High

RIVERSIDE TOWNSHIP RESILIENCE ACTION

Mitigation of Sewage Treatment Plant

Coordinate with the chief operator at the Sewage Treatment Plant to support the mitigation of flood risks to the Plant via retrofit and design to protect structures from future flood damage. This can include wet and dry floodproofing, and deployable flood barriers such as a Tiger Dam.

RESPONSIBLE PARTY Riverside Township

ESTIMATED COSTS $500K - $5M+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

3-5 years

PRIORITY RATING

Medium

RIVERSIDE TOWNSHIP RESILIENCE ACTION

Public Outreach and Education about Flood Mitigation

Institute a public information campaign to increase outreach and education for residents related to flood risk mitigation strategies they can take on their own property, as well as things they can do to decrease local flooding risk. Education topics include home retrofit options, flood insurance, the impacts of dumping (historically, dumping of leaves and yard waste has led to blocked drains and increased flooding during rainfalls), and buyout options through NJDEP Blue Acres. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Increasing participation in this program can remove vulnerable residents from flood prone areas.

RESPONSIBLE PARTY	Riverside Township
ESTIMATED COSTS	$10K - $250K+
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

★★★☆☆

Medium



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

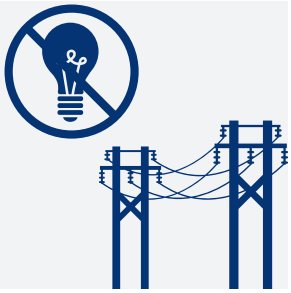


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



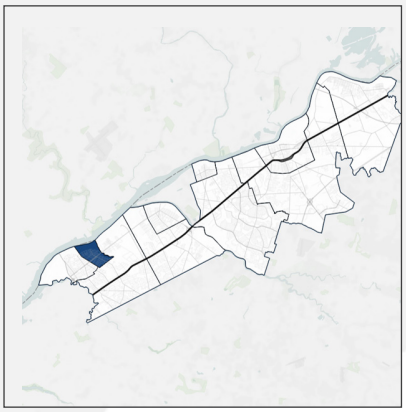
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.10: Riverton Borough CCRHVA



Summary of Vulnerabilities and Resilience Actions for Riverton Borough

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Riverton Borough and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Riverton Borough can be found in the northwest.



Sea Level Rise: Sea level rise is a growing concern for Riverton. The majority of the Borough has low sea level rise hazard exposure, but tidal inundation driven by sea level rise is concentrated in the northern and eastern borders, with its close proximity to the water.



Heat: Riverton Borough has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure can be found in the center of the Borough, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Riverton has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Riverton is in the northern and eastern borders.



Wildfire: Riverton has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. Wildfire potential in Riverton is highest in the south, near the Riverton Country Club, and in the east near the Pompeston Creek.



Drought: Riverton Borough has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure. Most of the land in Riverton Borough ranges from slightly drought-vulnerable to drought-vulnerable land.

Resilience actions were developed to address risks identified in Riverton Borough's vulnerability assessment, and include:

- Rehabilitation of Flood Wall along Delaware River
- Improve Local Drainage Infrastructure
- Commercial Property Cleanup
- Pompeston Creek Trail and Riparian Buffer Restoration
- Expansion of Green Infrastructure
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Located east of Palmyra and north and west of Cinnaminson Township, Riverton Borough (the Borough) has a population of 2,771 people, according to 2023 ACS data. The northern portion of Riverton fronts the Delaware River, while the eastern portion fronts Pompeston Creek. The Borough is substantially built out with residential uses, with little land dedicated to industrial uses or open space. The core of the Borough is a listed historic district with a large stock of 19th century and early 20th century Victorian style homes. River Rd, which divides the town from north to south, is the primary commercial center of the town and contains local retail, restaurants, and small offices. The Borough is served by a River LINE light rail station, which runs parallel to River Rd. **Table 6.10.1** shows socially vulnerable populations in Riverton Borough. Percentages that are higher than the State's percentages are shown in **bold**.

TABLE 6.10.1: Socially vulnerable populations in Riverton Borough.

DEMOGRAPHIC VARIABLE	RIVERTON BOROUGH	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	2,771	--	9,267,014	--
Total Household Units	1,049	--	3,775,842	--
Occupied Housing Units	1,014	--	3,478,355	--
Vacant Housing Units	35	--	297,487	--
Population 18 or Younger	598	21.60%	2,031,322	21.90%
Population 65 or Older	534	**19.27%**	1,559,816	16.83%
Population with a disability	171	6.40%	975,308	10.60%
Persons without a high school diploma	27	1.38%	600,736	9.30%

DEMOGRAPHIC VARIABLE	RIVERTON BOROUGH	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Persons below poverty level	162	6.07%	1,415,719	15.56%
Civilians (age 16+) unemployed	N/A*	3.40%	N/A*	6.20%
Persons uninsured	69	2.60%	682,266	7.40%
Persons who speak English "less than well"	23	0.87%	562,865	6.44%
Single Parent households	27	2.66%	198,943	5.72%
Minority Ethnicity (non-white)	575	20.75%	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	7	0.67%	639,960	16.95%
Crowded housing units	0	0.00%	129,710	3.73%
Households with no vehicle	16	1.60%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the Borough of Palmyra, Borough of Riverton, Cinnaminson Township, Delran Township, and Riverside Township took place on April 24th, 2025, from 6:30 to 8:30 p.m. Approximately 35 stakeholders attended the meeting, including the mayors of Delran, Borough of Riverton, and Riverside, and council members. Five attendees were affiliated with the Borough of Riverton. Attendees from Riverton were primarily concerned with issues of flooding, erosion, sea-level rise, and a lack of funds and resources available to fund the infrastructure upgrades needed to manage these changes. Problem areas identified include storm drains due to their limited capacity to handle higher precipitation rates and rising water levels in the river, and Bank Ave, in addition to other flood-prone streets. Stakeholders from Riverton indicated that the Sacred Heart Church, Riverton Memorial Park, Bank Ave, Main St, Borough Hall, the Riverton Sewer Plant, and historic trees and homes are their most valuable community assets. Resilience to stakeholders in Riverton means the implementation of

proper flood management and mitigation strategies, and other proactive planning mechanisms, which enable the community to withstand climate change-related impacts without extreme consequences.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

One attendee was from Riverton Borough. Poll responses stated that flooding and sea level rise in the community are not surprising but still important. Threats to critical infrastructure are a concern.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Cinnaminson Township, Palmyra Borough, and Riverton Borough in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Riverton.

The conversation focused on flooding impacts and actions. The Mayor of Riverton highlighted the importance and benefit of the road flood prevention work happening in Palmyra for Riverton residents, highlighting the connections among the 11 communities. Riverton also shared that they experience flooding when the Delaware River tide comes in and during heavy rainfall. In addition to the river flooding, it was noted that Jack's Run Creek floods with high tide.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of

the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed and the information needed for the development of all actions were discussed. The draft policy statements were also reviewed.

Officials from Cinnaminson and Riverton remarked on the need for collective action in approaching resilience. The two municipalities highlighted dredging issues, with Riverton noting that dredging could be complicated depending on the classification of the waterbody. The Riverton representative also noted that Jack's Run is a critical waterway with a lot of erosion along these banks. The issue is not limited to Riverton – homes on the Cinnaminson side have also flooded.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Riverton officials noted that they may be interested in all four of the regional actions mentioned, continuation of road maintenance to respond to climate change impacts, expansion of NJDEP's Blue Acres program, stream cleaning, bank stabilization, and channel restoration, and coordinated response to power outages.

Other potential resilience actions discussed include an action to reduce street flooding and install curb strips. The Borough noted that they would use native plantings with deeper root systems and would focus on the two areas the vulnerability assessment highlighted. Another resilience project discussed is the rehabilitation of the flood wall along the Delaware River. The entire northwest of Riverton is along the Delaware. Riverton participants noted that they would develop addition potential resilience actions.

Map and Survey Comments

The Project Team received 16 points of information for Riverton Borough, noting assets, climate concerns, problem areas, and resilience visioning. Flooding was a common theme. Drought and erosion were also noted. Commenters envisioned a future that includes prudent decision making to minimize loss and maximize preparedness, homes without flooding, clean air and water, good land management, preparedness, effective storm water management, and drought preparedness.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

RESILIENCE VISIONING COMMENTS

What does resilience mean to you?

Being able to deal with negative situations that deal with climate issues

Resilience means that our town governance and its residents become more educated about the most probable impacts of climate change so that we can make prudent choices to prepare our systems and infrastructure to accommodate for those changes that will allow for the least possible negative impacts to our residents' daily lives, their families, and way of life.

Imagine a future 50 years away. What do you hope to see in Burlington County?

In 50 years, I imagine a place where conversations are had that discuss all of the positive effects of the prudent decision-making that occurred over the last 50 years that minimized loss and maximized preparedness for the impacts of climate change.

My son being able to live in my home in Riverton without flooding being a major concern. Clean air and water, land managed well.

What does a resilient Burlington County look like to you?

A resilient Burlington County looks like communities working together to invest and prepare for the most probable impacts of climate changes.

One that can manage storm water, and deal with drought.

Flooding

Flooding is a significant area of concern for residents and community leaders in Riverton Borough and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Riverton Borough is in the northwest. These areas represent 21% of the land area in the Borough, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. A little over half of the Borough (52%) is within a modeled floodplain used in this analysis.

Figure 6.10.1 shows the spatial distribution of flood vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.10.1: Flood vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

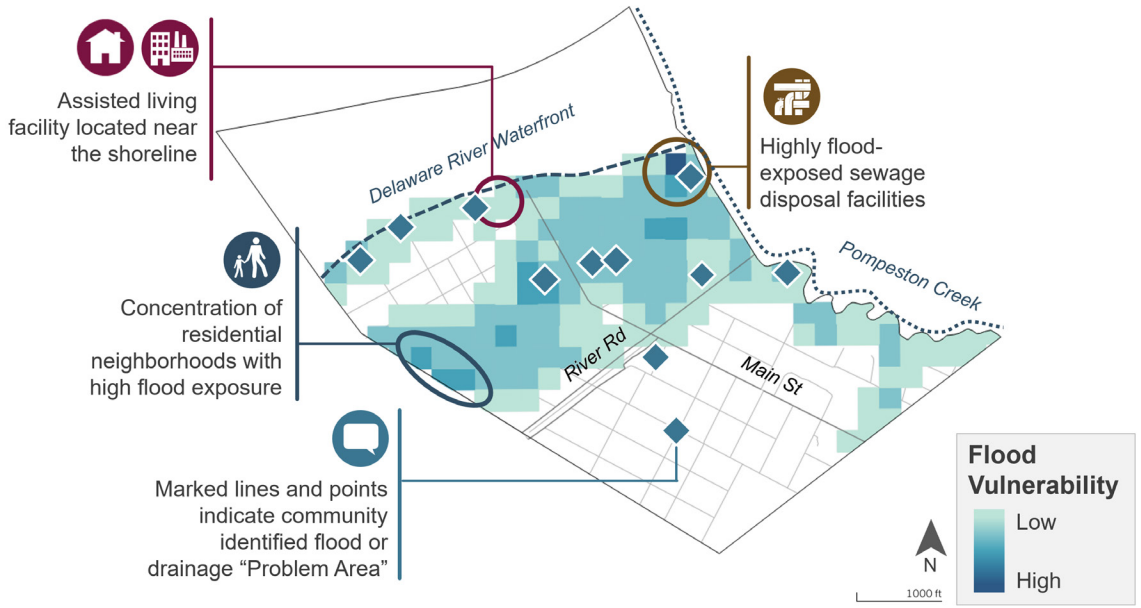
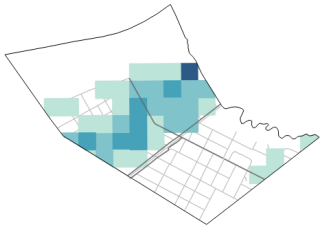


FIGURE 6.10.2: Flood exposure for four themes in Riverton Borough.



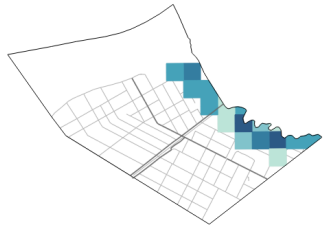
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Riverton Borough, approximately 4%, or 41 of the 1,083 residential buildings in the Borough are classified as having high flood exposure (within a 1% annual chance floodplain today), and 14%, or 11 of the 77 public and commercial buildings have high exposure, concentrated in the northeast along Pompeston Creek and in the west along Elm Ave and Linden Ave around 4th St and 2nd St.



CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Riverton Borough, 82% of utility infrastructure have a high exposure to flooding, all of which are sewage facilities. Additionally, a business property on Martha's Ln is a hazardous material site with flood exposure where flooding can lead to material releases that can pose public health concerns and environmental damage. Two miles of transportation routes in the Borough also have high flood exposure. Bank Ave has the highest mileage exposed among roadways, with 0.3 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Riverton Borough, all 17 acres of forests and shrublands in the Borough are exposed to high levels of flooding, all of which are in the northeast along Pompeston Creek. Similarly, all 9 acres of wetlands are also within high flood exposure areas, in the same general area along Pompeston Creek, but wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the north and east have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along Pompeston Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.10.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.10.2: Distribution of flood exposure scores for land area and assets in Riverton Borough based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	417 Acres	201 (48%)	39 (9%)	89 (21%)	88 (21%)
Community Resources					
Residential Buildings	1,083 Assets	734 (68%)	71 (7%)	237 (22%)	41 (4%)
Public & Commercial Buildings	77 Assets	38 (49%)	14 (18%)	14 (18%)	11 (14%)
Critical Infrastructure					
Utility Infrastructure	11 Assets	--	6 (17%)	1 (9%)	9 (82%)
Health & Emergency Services	2 Assets	2 (100%)	--	--	--
Hazardous Material Sites	5 Assets	2 (40%)	1 (20%)	1 (20%)	1 (20%)
Transportation Routes	15 Miles	9 (58%)	2 (10%)	3 (22%)	2 (10%)
Natural Infrastructure					
Forests & Shrubland	17 Acres	--	--	--	17 (100%)
Wetlands	9 Acres	--	--	--	9 (100%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a growing concern for Riverton. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Delaware and Pompeston Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the northern and eastern borders, with its close proximity to the water. Across the Borough, 33 acres, or 8%, of land area is modeled as exposed to present-day tidal inundation. The majority of the Borough has low sea level rise hazard exposure. Around the end of the century, 17% of the land area in the Borough may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.10.3 shows the spatial distribution of sea level rise vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.10.3: Sea level rise vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

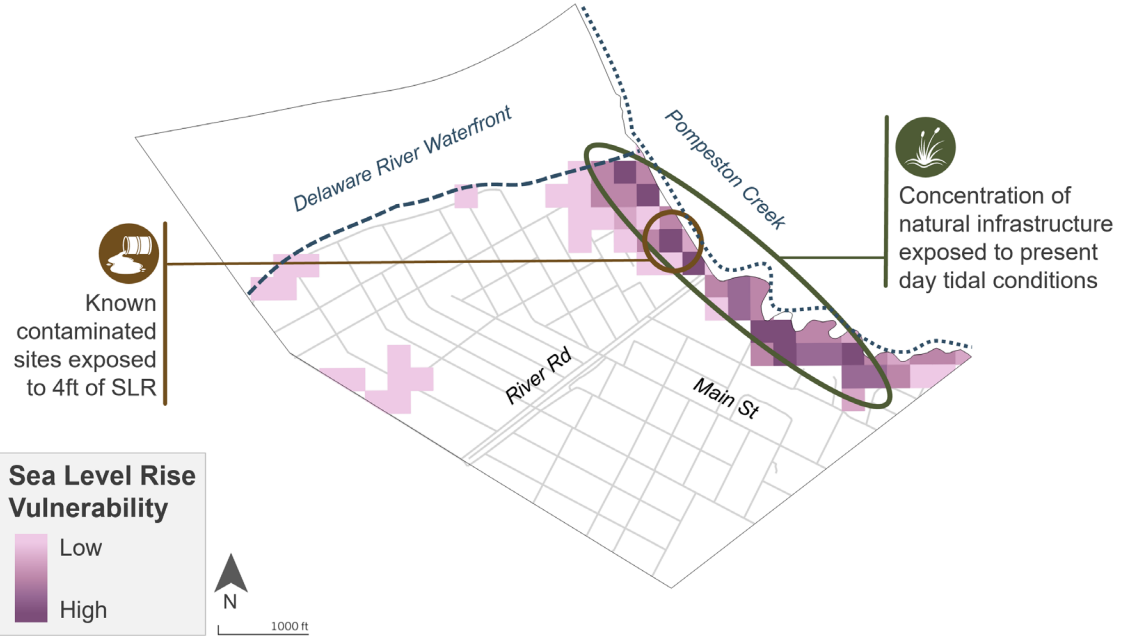
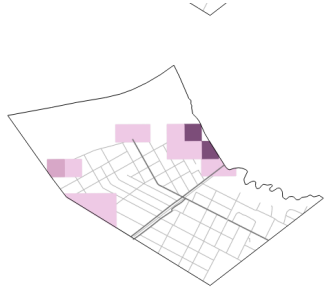


FIGURE 6.10.4: Sea level rise exposure for four themes in Riverton Borough.



COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Riverton, one home and two public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and 18 and 11, respectively, would be exposed at five feet. These buildings are concentrated in the northeast.



CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Riverton, seven critical infrastructure assets and 1.4 miles of roadway are exposed to 4-5 feet of tidal inundation. This includes multiple sewage treatment plant buildings.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. Wetlands are known to migrate inland with rising sea levels, if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around seven acres, representing 75% of wetlands in the Borough, are exposed to 4-5 feet of tidal inundation, centralized in the east, which lines the Pompeston Creek. Similarly, 76% of forests and shrublands are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the northern and eastern borders of the Borough, which line the Delaware River and the Pompeston Creek, have higher concentrations of socially vulnerable populations, which are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.10.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed.

TABLE 6.10.3: Distribution of sea level rise exposure scores for land area and assets in Riverton Borough based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	417 Acres	347 (83%)	12 (3%)	14 (3%)	10 (2%)	1 (<1%)	--	33 (8%)
Community Resources								
Residential Buildings	1,083 Assets	1,065 (98%)	15 (1%)	2 (<1%)	1 (<1%)	--	--	--
Public & Commercial Buildings	77 Assets	66 (86%)	9 (12%)	--	2 (3%)	--	--	--
Critical Infrastructure								
Utility Infrastructure	11 Assets	5 (45%)	6 (55%)	--	--	--	--	--
Health & Emergency Services	2 Assets	2 (100%	--	--	--	--	--	--
Hazardous Material Sites	5 Assets	4 (80%)	--	1 (20%)	--	--	--	--
Transportation Routes	15 Miles	14 (94%)	1 (3%)	0.2 (2%)	0.2 (1%)	--	--	--
Natural Infrastructure								
Forests & Shrubland	17 Acres	0.1 (1%)	0.2 (1%)	3 (16%)	1 (7%)	0.3 (2%)	--	13 (74%)
Wetlands	9 Acres	--	--	--	--	--	--	9 (100%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Riverton Borough has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Borough. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Borough can be found in the center of the Borough. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. None of the land area in the Borough has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 11% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

Figure 6.10.5 shows the spatial distribution of heat vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.10.5: Heat vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

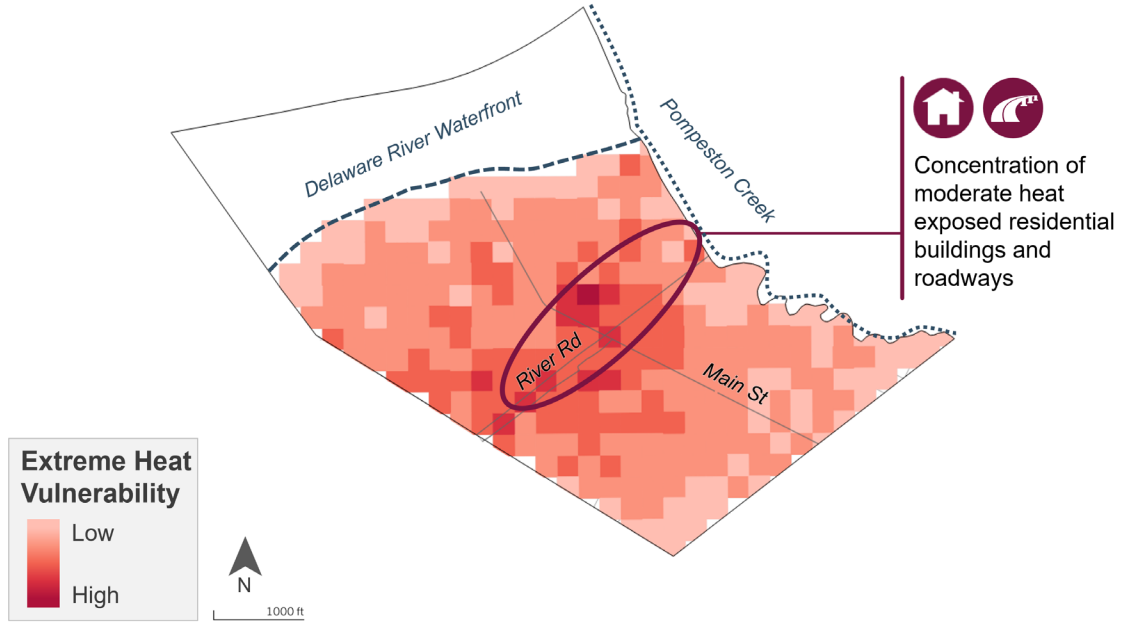
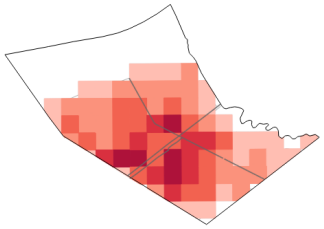
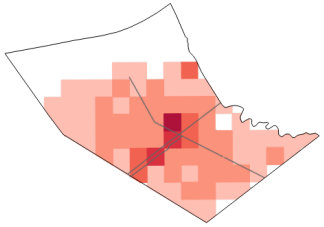


FIGURE 6.10.6: Heat exposure for four themes in Riverton Borough.



COMMUNITY RESOURCES

In Riverton Borough, no residential, public, and commercial buildings have at least moderate-high heat exposure. While 22% of buildings in the Borough that have moderate heat exposure are unlikely to be directly damaged by high temperatures (e.g., the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



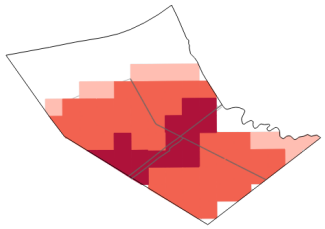
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. No utility infrastructure, health and emergency services facilities, hazardous material sites, and transportation routes in the Borough have greater than moderate heat exposure. While many critical infrastructure assets are designed to not be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, higher temperatures mean that pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Riverton Borough, all forests, shrublands, and wetlands are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are all in the east along Pompeston Creek.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the center of the Borough have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.10.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.10.4: Distribution of heat exposure scores for land area and assets in Riverton Borough based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	417 Acres	46 (11%)	293 (70%)	79 (19%)	--	--
Community Resources						
Residential Buildings	1,083 Assets	31 (3%)	833 (77%)	219 (20%)	--	--
Public & Commercial Buildings	77 Assets	1 (1%)	38 (49%)	38 (49%)	--	--
Critical Infrastructure						
Utility Infrastructure	11 Assets	1 (9%)	8 (73%)	2 (18%)	--	--
Health & Emergency Services	2 Assets	--	--	2 (100%)	--	--
Hazardous Material Sites	5 Assets	--	3 (60%)	2 (40%)	--	--
Transportation Routes	15 Miles	0.5 (3%)	10 (65%)	5 (32%)	--	--
Natural Infrastructure						
Forests & Shrubland	17 Acres	9 (52%)	8 (48%)	--	--	--
Wetlands	9 Acres	9 (99%)	0.1 (1%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Riverton has an overall very low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Riverton is in the northern and eastern borders. Overall, 18% of the land area in the Borough is considered exposed to landslides.

Figure 6.10.7 shows the spatial distribution of landslide vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.10.7: Landslide vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

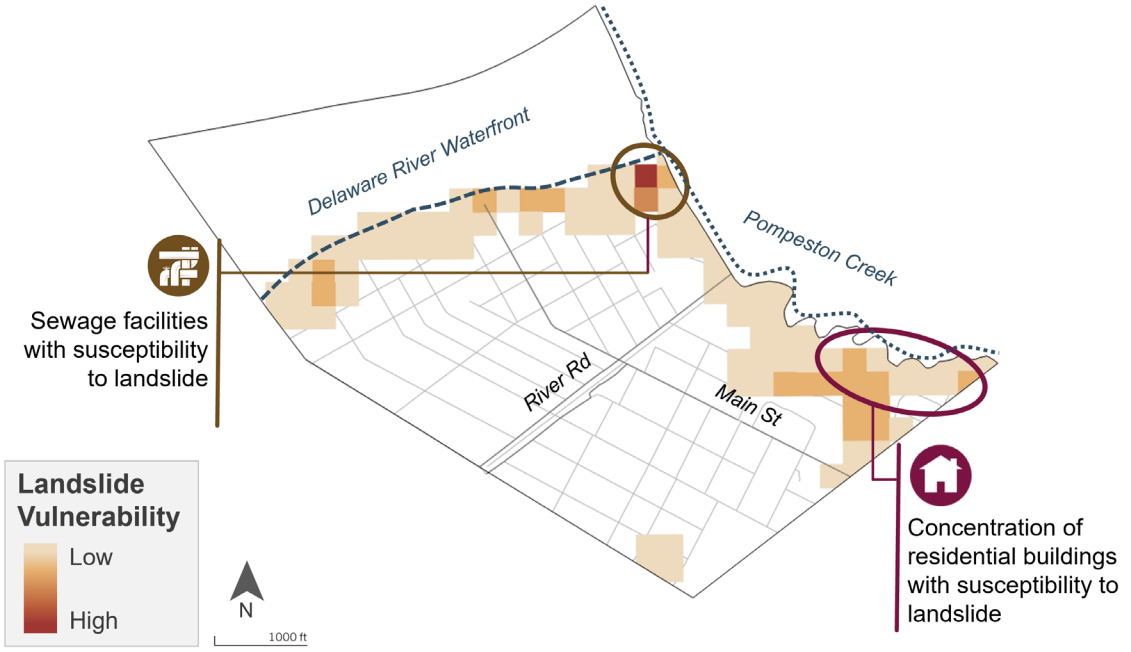
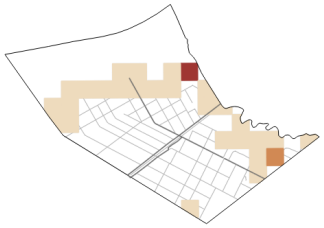


FIGURE 6.10.8: Landslide exposure for four themes in Riverton Borough.



COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Borough are outside of areas modeled as susceptible to landslides. Only 8% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.7% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated in the northeast.



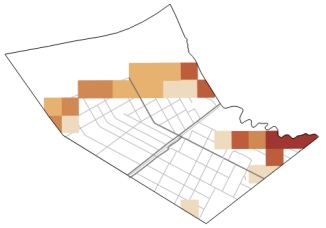
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Borough is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include the Baptist Home of South Jersey and multiple sewer disposal buildings. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are 10th St and Cedar St.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 19 acres, or 75%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 13% of forests and shrublands and 5% of wetlands have between moderate and high exposure. These areas are isolated in the southeast corner.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. The census tract has a low concentration of socially vulnerable populations, and areas within that tract with high landslide exposure include the northeast.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.10.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.10.5: Distribution of landslide exposure scores for land area and assets in Riverton Borough based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	417 Acres	337 (81%)	23 (5%)	51 (12%)	6 (1%)	--	--
Community Resources							
Residential Buildings	1,083 Assets	1,002 (93%)	34 (3%)	39 (4%)	8 (1%)	--	--
Public & Commercial Buildings	77 Assets	63 (82%)	3 (4%)	11 (14%)	--	--	--
Critical Infrastructure							
Utility Infrastructure	11 Assets	2 (18%)	1 (9%)	8 (73%)	--	--	--
Health & Emergency Services	2 Assets	2 (100%)	--	--	--	--	--
Hazardous Material Sites	5 Assets	3 (60%)	2 (40%)	--	--	--	--
Transportation Routes	15 Miles	13 (84%)	1 (7%)	1 (8%)	0.1 (1%)	--	--
Natural Infrastructure							
Forests & Shrubland	17 Acres	4 (24%)	4 (24%)	7 (40%)	2 (13%)	--	--
Wetlands	9 Acres	2 (24%)	2 (25%)	4 (46%)	0.4 (5%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Riverton has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Riverton is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if infrastructure in Riverton is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Riverton is highest in the south, near the Riverton Country Club, and in the east near the Pompeston Creek. These areas of relatively higher wildfire hazard potential are mostly forest and wetlands. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. None of the land area in the Borough has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

FIGURE 6.10.9: Wildfire vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

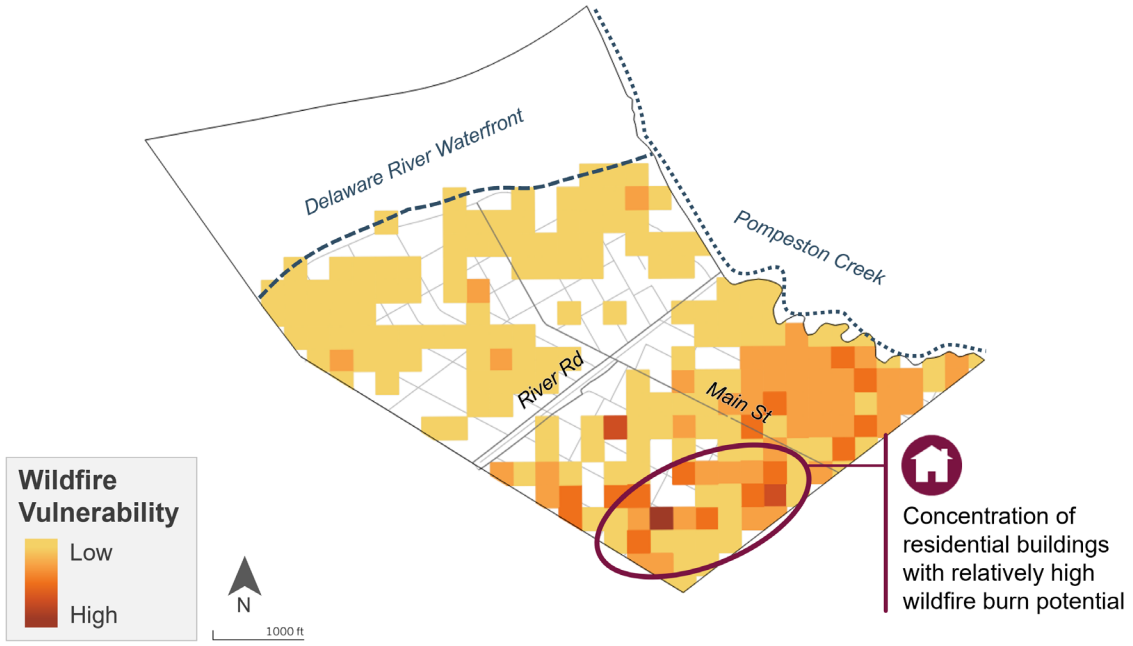
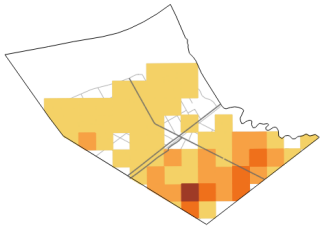


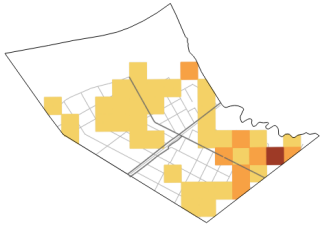
Figure 6.10.9 shows the spatial distribution of wildfire vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.10.10: Wildfire exposure for four themes in Riverton Borough.



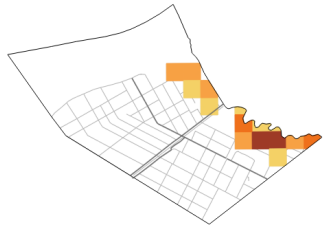
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Riverton are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure, such as in the south. Areas with higher density urban development, meanwhile, have lower exposure. Around 4% of buildings in the Borough have an annual likelihood of burning of at least 0.05%.



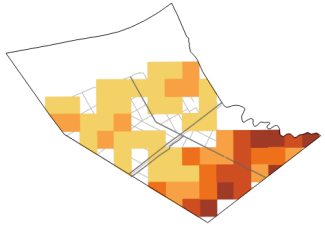
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Borough do not have any known wildfire hazard exposure. Roadways in more wildfire-prone areas include Bank Ave, 4th St, and Marthas Ln. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands all in the east have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Riverton communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Riverton in the surrounding areas can still cause harm to Riverton residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the southeast have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.10.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.10.6: Distribution of heat exposure scores for land area and assets in Riverton Borough based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	417 Acres	285 (68%)	51 (12%)	58 (14%)	24 (6%)	--	--
Community Resources							
Residential Buildings	1,083 Assets	9,674 (94%)	812 (75%)	122 (11%)	111 (10%)	38 (4%)	--
Public & Commercial Buildings	77 Assets	70 (91%)	4 (5%)	2 (3%)	1 (1%)	--	--
Critical Infrastructure							
Utility Infrastructure	11 Assets	10 (91%)	1 (9%)	--	--	--	--
Health & Emergency Services	2 Assets	2 (100%)	--	--	--	--	--
Hazardous Material Sites	5 Assets	4 (80%)	--	1 (20%)	--	--	--
Transportation Routes	15 Miles	13 (84%)	1 (7%)	1 (7%)	0.3 (2%)	--	--
Natural Infrastructure							
Forests & Shrubland	17 Acres	5 (30%)	6 (36%)	6 (34%)	--	--	--
Wetlands	9 Acres	1 (12%)	2 (23%)	6 (65%)	--	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Riverton Borough has an overall very low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Riverton Borough ranges from slightly drought-vulnerable to drought-vulnerable land. The majority of the land area in the Borough (89%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Riverton Borough spread throughout the Borough.

Figure 6.10.11 shows the spatial distribution of drought vulnerability across the Borough, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.10.11: Drought vulnerability index displayed using 250 ft x 250 ft grid cells and identified Focus Areas in Riverton Borough.

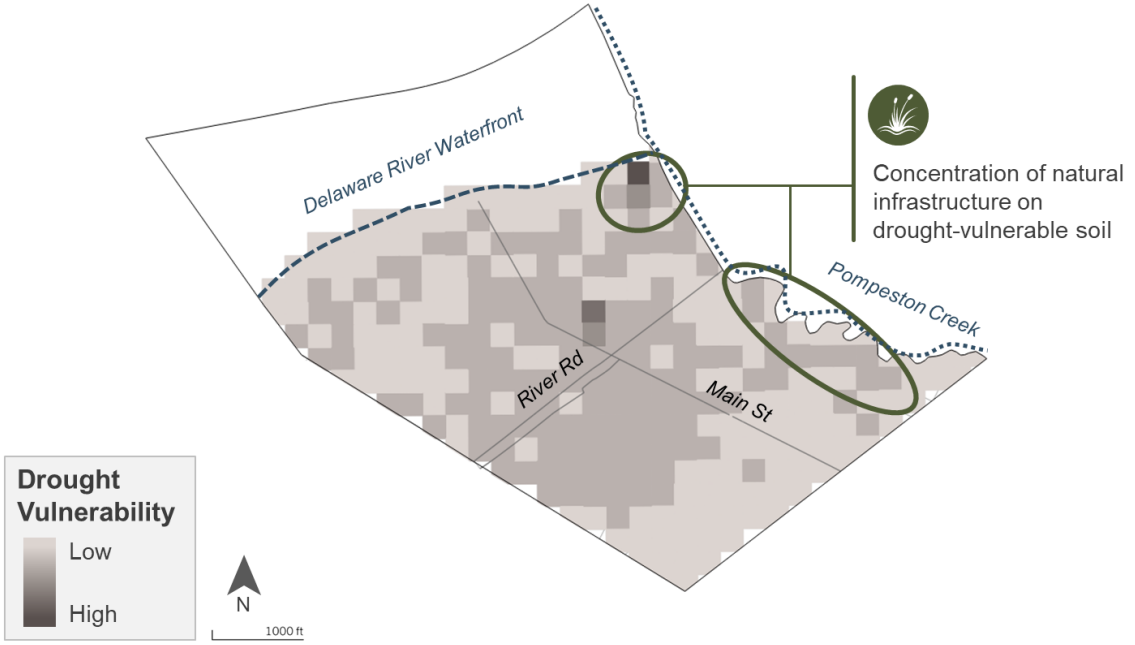
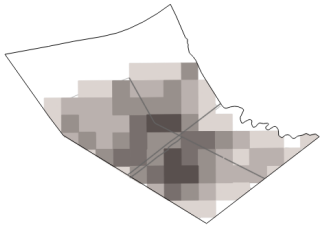
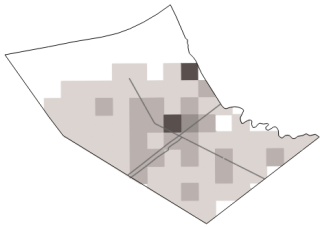


FIGURE 6.10.12: Drought exposure for four themes in Riverton Borough.



COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. That being said, there is no agricultural land in Riverton Borough. The majority of buildings (91%) are also on land modeled to be drought-vulnerable, spread throughout the Borough. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



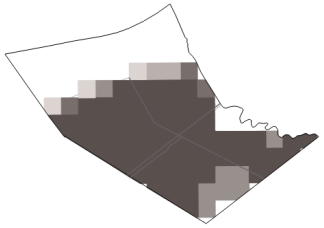
CRITICAL INFRASTRUCTURE

The majority of critical infrastructure assets in the Borough are on drought-sensitive soil. Between 80% and 100% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, with a large concentration in the northeast of the Borough. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. Riverton Borough, 67% of wetlands and 100% of forests and shrublands are modeled to have drought-vulnerable soil, in the eastern portion of the Borough.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts throughout the Borough have high rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.10.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.10.7: Distribution of drought exposure scores for land area and assets in Riverton Borough based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	417 Acres	--	3 (1%)	--	44 (11%)	370 (89%)
Community Resources						
Residential Buildings	1,083 Assets	--	--	--	100 (9%)	983 (91%)
Public & Commercial Buildings	77 Assets	--	--	--	1 (1%)	76 (99%)
Critical Infrastructure						
Utility Infrastructure	11 Assets	--	--	--	--	11 (100%)
Health & Emergency Services	2 Assets	--	--	--	--	2 (100%)
Hazardous Material Sites	5 Assets	--	--	--	1 (20%)	4 (80%)
Transportation Routes	15 Miles	--	--	--	2 (11%)	13 (89%)
Natural Infrastructure						
Forests & Shrubland	17 Acres	--	--	--	--	17 (100%)
Wetlands	9 Acres	--	3 (33%)	--	--	6 (67%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Planning efforts in Riverton have sparingly incorporated climate change-related initiatives. Climate change concerns have also been addressed in State, county and regional initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1998 Master Plan establishes early goals to preserve the community's small-town character and environmental features, emphasizing the preservation of open vistas and mature trees, particularly along the Delaware River. Notably, Objective 3 under Goal 3 encouraged the preservation and maintenance of the Borough's tree inventory.
- The 2006 Stormwater Management Plan was adopted to comply with NJDEP requirements and outlines strategies to manage runoff, reduce flooding, protect water quality, and safeguard sensitive environmental areas. It emphasizes best management practices such as groundwater recharge, pollutant filtration, and erosion control.
- The 2008 Open Space and Recreation Element highlights the Pompeston Creek and proposed varying strategies, such as creating buffer zones to reduce stormwater impact and improving creek health by removing invasive species.
- The 2018 Master Plan Update continues efforts to promote pedestrian movement, reduce vehicular tactic, and enhance green spaces with specific actions, including maintaining Riverton's tree canopy and supporting the Borough's Tree City, USA status. This document also identifies sewer infrastructure and facilities located in flood-prone areas as a long-term concern.
- Chapter 71, Flood Damage Prevention, amended in its entirety on May 5, 2024, by Ordinance No. #-2024, establishes Riverton Borough's commitment to proactive flood hazard management. This chapter outlines the policies regulating development within designated flood hazard areas to protect public safety and minimize property damage. It also assigns responsibility to the Floodplain Administrator to interpret and enforce the ordinance in accordance with local requirements and NJDEP regulations.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Riverton Borough has a high hazard rating for severe weather; medium ratings for dam failure, disease outbreak, extreme temperatures, and severe winter weather; and low ratings for drought, earthquake, flood, and wildfire. The Borough demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter

weather; a moderate capacity in dealing with dam failures and severe weather; and a low capacity in dealing with drought, earthquakes, floods, and wildfires.

STATE EFFORTS

- NJDEP's 2014 CVI found the highest-risk and moderate-risk areas within the Borough were along the Pompeston Creek and the Delaware River.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Riverton Borough is characterized by a substantial inventory of historic properties, which limits traditional development activity and reduces both parcel and land availability within the zoning framework.

The Borough includes a mix of residential, commercial, and special-purpose zoning districts. Residential zones range from dense infill neighborhoods with minimum lot sizes of 4,000 square feet to low-density areas requiring up to 15,000 square feet per lot. Commercial zoning supports small-scale retail and mixed-use applications with lot sizes starting at 4,000 square feet, and one Affordable Housing district allows compact units aligned with inclusionary development standards. The Parks District is excluded from buildout calculations due to its recreational designation and lack of a defined minimum lot area.

Riverton is one of the few municipalities within the Study Area which carries density standards for specific zoning districts. This comes in the form of a Maximum Residential Density measured by Dwelling Units (DUs) per Acre. That maximum and the zone for

TABLE 6.10.8: Riverton Borough zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-4 (Residence District 4)	4,000 square feet
R-8 (Residence District 8)	8,000 square feet
R-15 (Residence District 15)	15,000 square feet
R-2	15,000 square feet
Commercial Zones' Minimum Lot Areas	
NB (Neighborhood Business District)	4,000 square feet
GB (General Business District)	8,000 square feet
Special Purpose Zones' Minimum Lot Areas	
AH (Affordable Housing District)	5,000 square feet (6.0 DU/Acre Maximum Residential Density)
P (Parks District)	Not assigned a minimum lot area; excluded from buildout

which it applies are included below. **Table 6.10.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development patterns such as historic property protections and affordable housing overlays, the amount of land available for new subdivision can be totaled. Riverton Borough contains 473 parcels across all zoning districts able to be analyzed for this buildout and has an estimated 5,850,000 square feet (or 135 acres) of unconstrained land capable of a complete buildout. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating buildout capacity using the zones' minimum lot area requirements.

Riverton Borough's buildout analysis indicates that, among the few nonresidential zones in the Borough, the General Business Zone has the capacity to see the most growth from the current condition, as shown in **Table 6.10.9**. It is noted that this zone coincides with one of the only semi-industrial uses in the zone, the likes of which historically carry large lots. Further, the current number of parcels in the zone being seven, compared to a possible 73, is an indicator that the current

TABLE 6.10.9: Riverton Borough buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*	MAX NO. OF DWELLING UNITS IN ZONE
AH	1	50,201.46	1.15	5,000	10	6
GB	7	580,269.37	13.32	8,000	73	--
NB	20	276,502.32	6.35	4,000	69	--
R-15	32	510,172.13	11.71	15,000	34	--
R-15	9	146,384.99	3.36	15,000	10	--
R-15	5	100,078.75	2.30	15,000	7	--
R-15	15	220,304.51	5.06	15,000	15	--
R-4	48	352,317.78	8.09	4,000	88	--
R-4	57	448,382.83	10.29	4,000	112	--
R-4	7	13,027.37	0.30	4,000	3	--
R-8	81	921,126.62	21.15	8,000	115	--
R-8	50	563,679.41	12.94	8,000	70	--
R-8	111	1,417,432.30	32.54	8,000	177	--
R-8	30	243,846.17	5.60	8,000	30	--

* *Maximum buildout hypothetical*

uses that have historically occupied the site operate on areas not considered in the Borough's zoning standards.

In addition to the General Business Zone, the Borough's Neighborhood Business Zone carries a high increase possible for nonresidential uses in the Borough, which does not constitute much of the overall area in the municipality. It is also noted that the Neighborhood Business Zone is one of the only areas in the Borough which carry mixed-use buildings with commercial on the ground floor and residential apartments above.

The R-15 districts throughout the Borough are effectively built out. The residential zone that appears to carry the highest capacity in terms of percentage increase is the R-4 Zone along Linden and Park Aves (south of the railroad tracks). It is estimated that the land concurrent with that R-4 Zone has the capacity to nearly double the number of existing lots compared to current conditions. The R-8 zones throughout the Borough, however, do appear to carry some potential capacity should a borough-wide redevelopment pattern occur.

Finally, the lone Affordable Housing Zone in the Borough is the only one with residential density standards established. This is by design as the zone was established as part of Riverton's Round 3 Fair Share Affordable Housing Compliance mechanism. It is noted that the number of lots possibly outpacing the maximum residential density is likely by design, as to ensure that the development of the AH Zone is compatible with the surrounding zones.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/ industrial areas where large lots can have

FIGURE 6.10.13: Riverton Borough War Memorial. *(Source: Riverton Borough)*



multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Borough prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The Borough has no planned redevelopment areas currently.

ROUND IV OF AFFORDABLE HOUSING

The DCA determined the Round 4 Present Need of 0, and Prospective Need for Riverton Borough of 30 units of affordable housing. Through Resolution 32-2025, the Borough accepted DCA's number. The 30-unit Prospective Need Obligation will be addressed through a vacant land adjustment due to the lack of available vacant, developable land within the Borough. The vacant land adjustment is provided as an Appendix to the HEFSP.

Resilience Strategy

Riverton Borough's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Riverton Borough.

> In order to best serve its residents, Riverton Borough is committed to preserving its historic and residential character while adapting to extreme weather and climate change impacts. The Borough aims to protect its people, natural, and cultural features that define its riverfront identity. It recognizes the natural features' crucial role in resilience against flooding, storms, and the threats these hazards pose to the historic structures within the Borough. Promoting diverse, multigenerational housing supports a strong, inclusive community prepared for future environmental challenges. Riverton is pursing ways to strengthen the local economy alongside efforts to enhance sustainability and climate adaptability.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key

risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

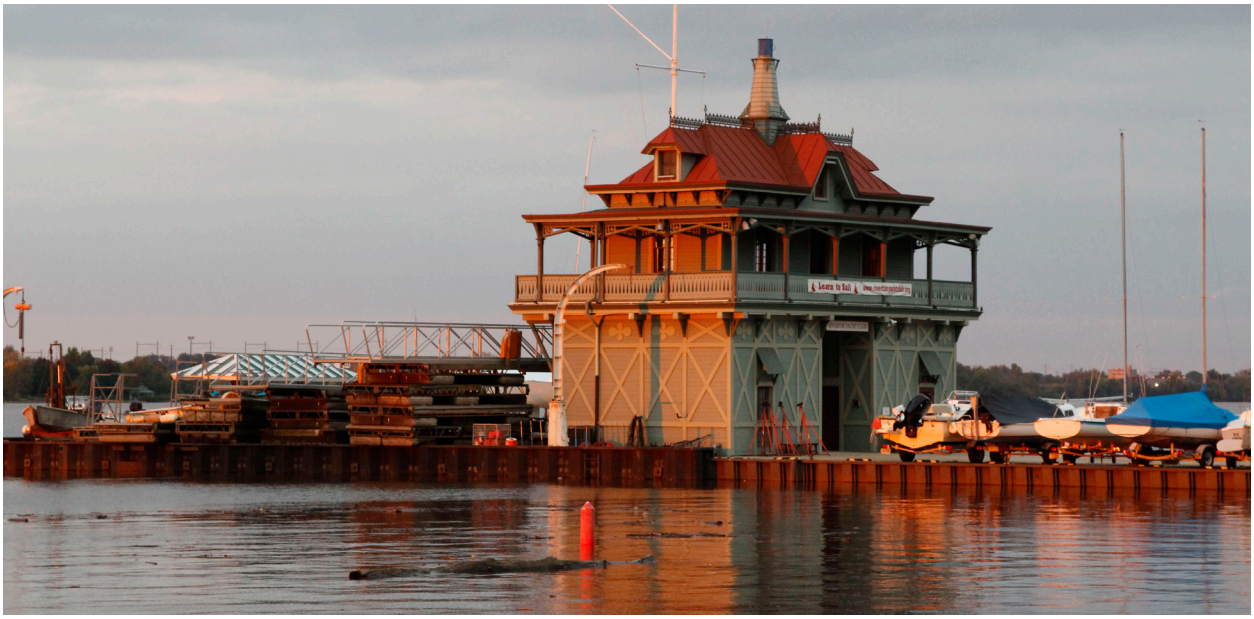
RIVERTON BOROUGH RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.

FIGURE 6.10.14: Riverton Yacht Club at sunset. *(Source: Rockboy1009, Wikimedia Commons, CC-BY-SA-4.0)*



RIVERTON BOROUGH RESILIENCE ACTION

Rehabilitation of Flood Wall along Delaware River

The entire northwest end of Riverton is along the Delaware River. The flood wall exists for the entire length and is owned by both private and public entities. Public ownership is located at street-end pocket parks. The Borough would like to rehabilitate the length of the wall in locations in need of repair.

RESPONSIBLE PARTY Riverton Borough

ESTIMATED COSTS $500K - $1M

POSSIBLE SOURCE(S) OF FUNDING Grants



Source: Riverton Borough

ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

★★★★★

High

RIVERTON BOROUGH RESILIENCE ACTION

Improve Local Drainage Infrastructure

The Borough will identify and prioritize areas most vulnerable to flooding and determine appropriate mitigation strategies. This would include installing curb strips and using native plantings and other natural infrastructure with deeper root systems to minimize flooding.

RESPONSIBLE PARTY Riverton Borough, NJDOT

ESTIMATED COSTS $500K - $1M+

POSSIBLE SOURCE(S) OF FUNDING Grants



ESTIMATED TIMELINE

0-5 years

PRIORITY RATING

Medium

RIVERTON BOROUGH RESILIENCE ACTION

Commercial Property Cleanup

Identify and prioritize commercial properties in need of cleanup and revitalization. Collaborate with property owners, local organizations, and state resources to restore and maintain these sites. Provide guidance and transparency throughout the process, and coordinate with municipal code enforcement and public works for debris removal.

RESPONSIBLE PARTY Riverton Borough, Local Business Owners

ESTIMATED COSTS $250K

POSSIBLE SOURCE(S) OF FUNDING Grants, Remediation Investment by Business Owners



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

Medium

RIVERTON BOROUGH RESILIENCE ACTION

Pompeston Creek Trail and Riparian Buffer Restoration

Expand the recently re-established trail along the Pompeston Creek to include native plantings and riparian buffer restoration. This action would reduce erosion, improve water quality, and enhance community access to open space.

RESPONSIBLE PARTY Riverton Environmental Commission, Public Works, Volunteers

ESTIMATED COSTS $500 - $2K

POSSIBLE SOURCE(S) OF FUNDING NJDEP Watershed Restoration Grants, Sustainable Jersey, Local Donations



Source: Riverton Borough

ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

★★★☆☆

Medium

RIVERTON BOROUGH RESILIENCE ACTION

Expansion of Green Infrastructure

Expand the use of green infrastructure practices throughout Riverton to improve stormwater management, reduce localized flooding, and mitigate heat impacts. Actions may include maintaining and expanding rain gardens and bioswales, incorporating native and adaptive vegetation in municipal rights-of-way and curb strips, increasing tree canopy where feasible, and integrating green infrastructure elements into municipal projects, parks, and streetscapes. These practices slow stormwater runoff, increase infiltration, reduce pressure on drainage systems, and improve overall ecological resilience.

RESPONSIBLE PARTY Riverton Public Works, Environmental Commission and Green Team, Planning Board, Borough Council

ESTIMATED COSTS $500 - $20K

POSSIBLE SOURCE(S) OF FUNDING NJDEP Stormwater and Resilience Grants, Burlington County, Capital Funds, Volunteer Programs, Community Partnerships



ESTIMATED TIMELINE

1-10 years*

PRIORITY RATING

Medium

**initial pilot projects and maintenance improvements could begin within 1–2 years*



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

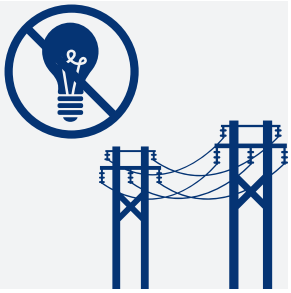


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



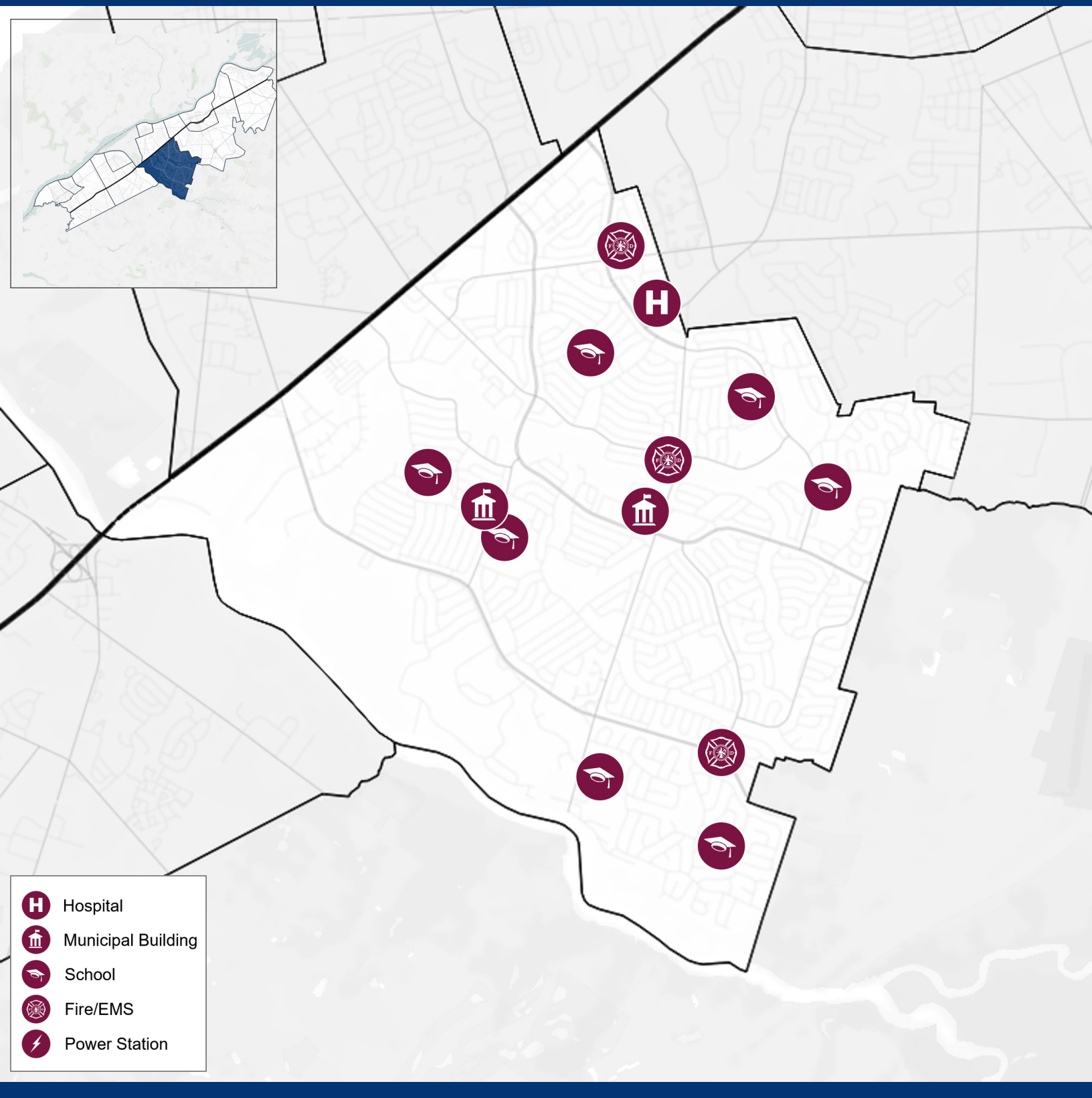
REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 6.11: Willingboro Township CCRHVA



Summary of Vulnerabilities and Resilience Actions for Willingboro Township

The CCRHVA process focused on analyzing the impacts of current and future hazards on critical facilities, natural infrastructure, and other systems through both quantitative data analysis and community engagement. This page provides a high level overview of the results of the analysis, and additional details follow.



Flooding: Flooding is a significant area of concern for residents and community leaders in Willingboro Township and one of the primary sources of direct risk for assets and residents alike. The majority of flood exposure in Willingboro Township can be found in the southwest along Rancocas Creek and in the center of the Township along Mill Creek.



Sea Level Rise: Sea level rise is a small but growing concern for Willingboro. The overall extent of sea level rise hazard exposure in the Township is low, with a significant majority of the land having no exposure to sea level rise. Tidal inundation driven by sea level rise is concentrated in the south, especially along the water.



Heat: Willingboro Township has an overall moderate risk of extreme heat compared to other hazards. Areas with the highest heat exposure in the Township are concentrated in the northern tip of the Township, and are generally caused by high amounts of impervious surfaces and lower amounts of green space.



Landslide: Willingboro has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. The majority of landslide exposure in Willingboro is in the east, especially along the Rancocas Creek.



Wildfire: Willingboro has an overall moderate risk ofwildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. Wildfire potential in Willingboro is highest in the south along Rancocas Creek.



Drought: Willingboro Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Most of the land in Willingboro Township ranges from slightly drought vulnerable to drought vulnerable land.

Resilience actions were developed to address risks identified in Willingboro Township's vulnerability assessment, and include:

- Improve Local Drainage Infrastructure
- Neighborhood Scale Drainage Study
- Public Outreach and Education about Flood Mitigation
- Establish a Cooling Center Program
- Physical and Programmatic Actions to Reduce Extreme Heat
- Continuation of Road Maintenance to Respond to Climate Change Impacts
- Stream Cleaning, Bank Stabilization, and Channel Restoration
- Coordinated Response to Widespread Power Outages
- Expansion of NJDEP's Blue Acres Program

These community-specific vulnerabilities and actions, along with other components of the CCRHVA, are presented in more detail in the following sections.

Community Characteristics and Demographics

Willingboro Township (the Township) is situated south of Edgewater Park on the southern side of Route 130 and contains a population of 31,944 people. Despite being located inland and away from the Delaware River, the southwestern extent of the Township abuts the Rancocas Creek. Branching off from the Rancocas Creek and traversing through the center of the Township is Mill Creek. The Township consists primarily of single-family homes and wetland areas along Rancocas Creek and Mill Creek. **Table 6.11.1** shows socially vulnerable populations in Willingboro Township. Percentages that are higher than the State's percentages are shown in **bold**.

In the fall of 2025, Willingboro completed a CCRHVA as part of its Master Land Use Element update. This CCRHVA recognizes the previous work and builds upon it.

TABLE 6.11.1: Socially vulnerable populations in Willingboro Township.

DEMOGRAPHIC VARIABLE	WILLINGBORO TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Total Population	31,944	--	9,267,014	--
Total Household Units	11,502	--	3,775,842	--
Occupied Housing Units	10,765	--	3,478,355	--
Vacant Housing Units	737	--	297,487	--
Population 18 or Younger	6,618	20.70%	2,031,322	21.90%
Population 65 or Older	5,491	**17.19%**	1,559,816	16.83%
Population with a disability	5,113	**16.10%**	975,308	10.60%
Persons without a high school diploma	1,550	6.78%	600,736	9.30%
Persons below poverty level	4,603	14.43%	1,415,719	15.56%

DEMOGRAPHIC VARIABLE	WILLINGBORO TOWNSHIP	PERCENTAGE OF POPULATION	STATE OF NEW JERSEY	PERCENTAGE OF POPULATION
Civilians (age 16+) unemployed	N/A*	8.70%	N/A*	6.20%
Persons uninsured	1,856	5.90%	682,266	7.40%
Persons who speak English "less than well"	709	2.37%	562,865	6.44%
Single Parent households	1,015	**9.43%**	198,943	5.72%
Minority Ethnicity (non-white)	28,696	**89.83%**	4,453,673	48.06%
Mobile homes	0	0.00%	35,303	0.90%
Housing with 10 or more units	389	3.38%	639,960	16.95%
Crowded housing units	92	0.85%	129,710	3.73%
Households with no vehicle	276	2.60%	391,842	11.30%

* *Source Data Excluded Numbers (Table DP03 "Selected Economic Characteristics")*

Source: 2023 American Community Survey (ACS)

Stakeholder Engagement

Stakeholder engagement was a key component of the CCRHVA process as local stakeholders shared important insights about areas impacted by climate change, their vision for long-term resilience, short, medium, and long-term resilience actions, and much more. In 2025, the Project Team held in-person and virtual community meetings, virtual meetings with elected officials, town administrators, town engineers, and planning board secretaries, and created online platforms for community members to provide comments.

Community Meetings

The public meeting for the City of Beverly, and the Townships of Edgewater Park and Willingboro took place on April 22nd, 2025, from 6:00-8:00 p.m. Approximately 10 stakeholders attended the meeting. Three attendees were affiliated with the Township of Willingboro. Attendees from Willingboro Township were primarily concerned with issues of property damage related to flooding. Problem areas identified include catch basins with limited capacity to manage stormwater, and roadways such as Sunset Corridor, Genesee Ln, Northampton Dr, and Van Sciver Parkway. Respondents indicated that their most valuable community assets are a food pantry, water treatment facilities such as pump stations and water treatment plants, community centers and recreation centers, schools, the fire department, and the Town Center business district.

The Project Team convened the second public meeting on July 30, 2025, at 6:00 p.m. as a virtual meeting that was open to all stakeholders and members of the public from the Study Area. A total of 25 people attended the meeting. The purpose

of the meeting was to share progress on community engagement, the results of the draft vulnerability assessment, and to identify objectives and priorities for adaptation and resilience actions. The meeting included an on-screen slide show presentation, five interactive polls, and a question-and-answer portion.

Three attendees were from Willingboro Township. Willingboro attendees noted that the town often loses power during heat waves and heavy storms when trees fall. Poll results indicated critical infrastructure as an asset that is important to address. Poll results also indicated support for vulnerable populations as a secondary benefit to resilience projects.

Meetings with Local Officials

MEETING ONE (JUNE)

The Project Team held a virtual meeting with elected officials, business administrators, town engineers, and planning board secretaries from Beverly City, Edgewater Park, and Willingboro in June. The meeting's goals were to engage municipal leadership in the planning process, share insights from prior public engagement, review relevant plans and documents related to climate change hazards, and collect feedback to guide the vulnerability assessment and future resilience planning efforts. The Project Team also sought to learn about existing resilience efforts and align future engagement activities with the intention of improving resilience processes and measures already in place in each of the previously mentioned communities. To start the meeting, an overview of the Resilient NJ program was provided, followed by an explanation of the requirement by municipalities to conduct a CCRHVA as a means of compliance with the MLUL. An overview of the components of a CCRHVA was provided for meeting attendees by the Project Team.

An overview of engagement to date, and an explanation of the project's expedited timeline due to federal funding changes was also provided by NJDEP, followed by a summary of the April in-person meeting takeaways for all three groups (in-person meetings were consolidated into three geographic sub-groups rather than the four created for these virtual business administrator meetings), and a more thorough breakdown of feedback gathered for Willingboro.

MEETING TWO (JULY)

The second virtual meeting was held in July. The meeting's goals were to share the initial results of the vulnerability analyses for the municipalities, discuss potential resilience actions, and share the draft policy statements for the municipal officials' review.

The Project Team highlighted the steps of the vulnerability assessment, the hazards analyzed, the resources identified, and key results of the analysis. Potential resilience actions were discussed, and the information needed for the development of all actions were discussed. The draft policy statements were also reviewed. Officials from Willingboro expressed interest in learning more about best practices from across the country on different types of resilience actions.

MEETING THREE (OCTOBER)

The third and final virtual meeting was held in October. The meeting's goals were to share the results of the vulnerability assessment and develop resilience actions. During this meeting, the Project Team highlighted the findings from the

vulnerability assessment, including key findings for each municipality. The Project Team also reviewed submitted resilience actions to obtain more information on them and continued working with municipalities that did not previously submit resilience actions to develop actions that address vulnerabilities. The group also discussed redevelopment areas for clarity in understanding for the buildout analysis.

Willingboro officials noted that addressing heat impacts from climate change and flooding impacts are the most critical for them. Due to the high density of Willingboro Township, there are a lot of impervious surfaces. Potential resilience actions addressing heat impacts could be cooling centers at the library and the JFK Center. Other potential actions could be increasing tree canopy and hydration stations. The areas around Rancocas Creek and Mill Creek and tributaries are vulnerable areas. Potential resilience actions to address flooding impacts were discussed. These actions could include drainage system upgrades, stormwater storage, and increasing capacity during extreme rain events. Another action could be installing systems to prevent beavers from getting into the infrastructure surrounding Batted Lake Pond. Currently, beavers are inhabiting the area and beavers' dams are impacting the movement of stormwater. A final potential resilience action focusing on flooding is residential outreach, education, and communication around flood response and mitigation. Willingboro officials noted that they were interested in regional resilience actions including continuation of road maintenance to respond to climate change impact, stream clearing, bank stabilization, and channel restoration, and coordinated response to widespread power outages.

Vulnerability Assessment

The Project Team leveraged best-available hazard and asset data to quantitatively assess and map asset exposure, sensitivity, and vulnerability across six different hazards, including flooding, sea level rise, heat, landslide, wildfire, and drought.

FIGURE 6.11.1: Willingboro Municipal Complex. *(Source: Willingboro Township)*



Flooding

Flooding is a significant area of concern for residents and community leaders in Willingboro Township and one of the primary sources of direct risk for assets and residents alike. Flooding occurs when water overflows the normal confines of a river, stream, or other body of water, or when water accumulates over areas that are not normally submerged. The analysis of flood exposure focuses on areas and assets exposed to riverine-driven flooding, based on modeled flood event conditions with a 1% and 0.2% annual chance of occurring. This analysis is expanded to account for future conditions by identifying areas exposed to flooding with an additional factor of three feet of water elevation. Although not modeled in this analysis, prolonged or intense rainfall can also inundate inland areas when runoff overwhelms natural or built drainage systems, leading to stormwater flooding and ponding. See **Section 3** for a more detailed explanation of the flood hazard.

The majority of flood exposure in Willingboro Township is in the southwest along Rancocas Creek and in the center of the Township along Mill Creek. These areas represent 16% of the land area in the Township, which are considered to be high flood exposure, or within the 1% annual chance floodplain of today. The majority of the Township is not within a modeled floodplain used in this analysis.

Figure 6.11.2 shows the spatial distribution of flood vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by flooding.

FIGURE 6.11.2: Flood vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

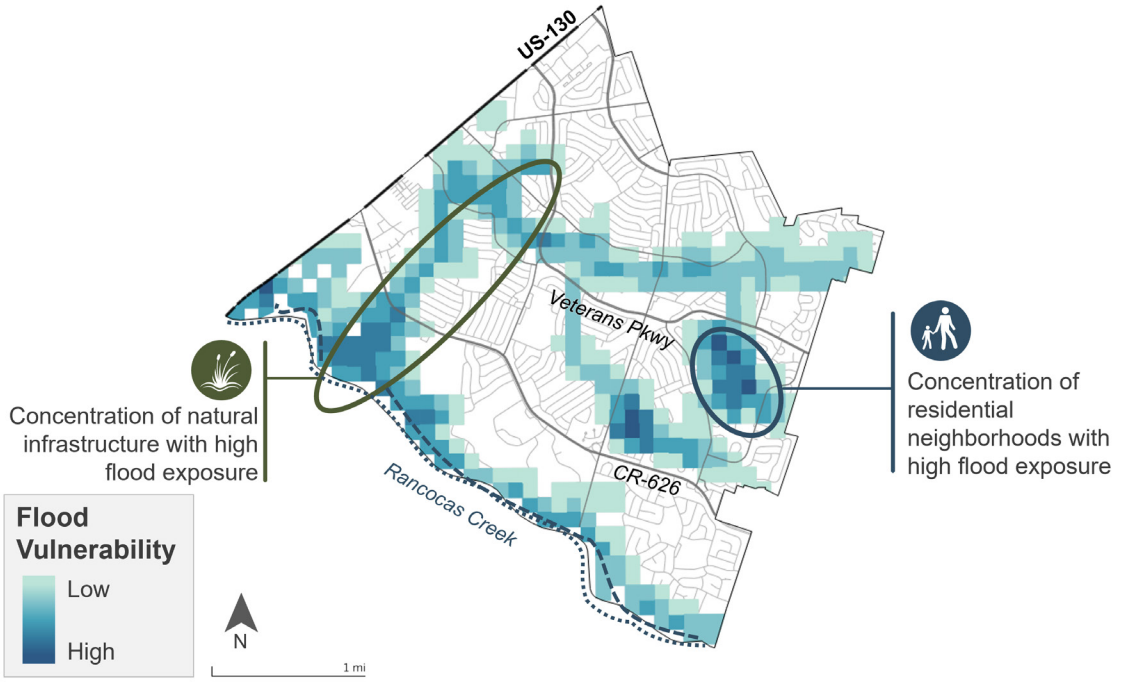
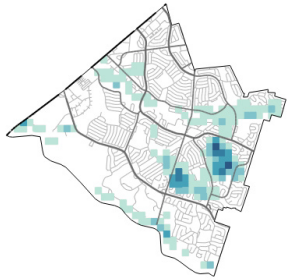
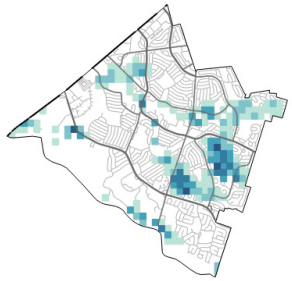


FIGURE 6.11.3: Flood exposure for four themes in Willingboro Township.



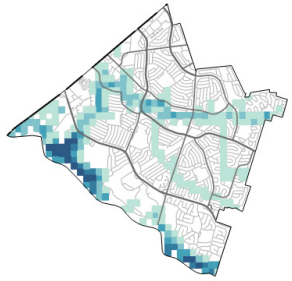
COMMUNITY RESOURCES

Floodwaters can lead to severe long-term building damage, often leading to displacement and disruption of services. In Willingboro Township, approximately 3%, or 301, of the 10,288 residential buildings in the Township are classified as having high flood exposure (within a 1% annual chance floodplain today), and 2%, or 12, of the 710 public and commercial buildings have high exposure, with a large concentration in the southeast around East River Dr and Eastbrook Ln. 0.3 acres of agricultural land in the Township is also considered to have high flood exposure, all of which is in a small pocket in the south of the Township off of Tiffany Ln.



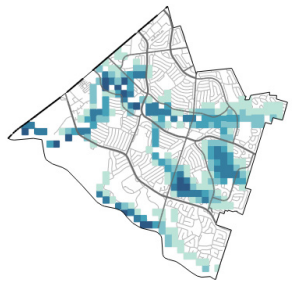
CRITICAL INFRASTRUCTURE

Flooding can damage critical infrastructure and disrupt essential services, especially if assets are not designed with flood resilience measures in mind. In Willingboro Township, none of the utility infrastructure and health and emergency service facilities have a high exposure to flooding. Methode Electronics Inc. at Willingboro Industrial Park is a hazardous material site with moderate flood exposure where flooding can lead to material releases that can pose public health concerns and environmental damage. Seven miles of transportation routes in the Township also have high flood exposure, and 0.1 miles of those are evacuation routes. Eastbrook Ln has the highest mileage exposed among roadways, with 0.6 miles of roadway exposed to a 1% annual chance flood.



NATURAL INFRASTRUCTURE

Natural infrastructure is less sensitive to flooding than other assets, as flooding is a natural process that most forests and wetlands are able to withstand. In Willingboro Township, 113 acres, or 41%, of forests and shrublands in the Township are exposed to high levels of flooding, concentrated in the south and west along Rancocas Creek. Similarly, 84% of wildlife habitat areas and 83% of wetlands are also within high flood exposure areas, along Rancocas Creek and Mill Creek, but wetlands are even more resilient to flooding effects than other asset types.



SOCIAL FABRIC

During floods, demographic factors such as poverty and household composition significantly affect event response and recovery. Census tracts in the west have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss during and after a flood. While most residential structures are outside of the modeled floodplains, flooding along Rancocas Creek and Mill Creek may disproportionately affect elderly residents, persons with disabilities, and households with lower income, education, and households with limited financial resources.

FLOOD EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various flood exposure categories are provided in **Table 6.11.2**. Exposure categories are based on riverine flood event AEP and sea level rise condition, and represent the smallest flood event to which an area or asset is exposed.

TABLE 6.11.2: Distribution of flood exposure scores for land area and assets in Willingboro Township based on event AEP, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE	HIGH
		Outside Mapped Floodplains	*Exposed to 1% AEP Event or designated low-lying area with 3ft SLR*	*Exposed to Present-Day 0.2% AEP Event*	*Exposed to Present-Day 1% (AEP) Event*
Land Area	4,886 Acres	3,423 (70%)	517 (11%)	141 (3%)	805 (16%)
Community Resources					
Residential Buildings	10,288 Assets	9,030 (88%)	916 (9%)	41 (<1%)	301 (3%)
Public & Commercial Buildings	710 Assets	635 (89%)	53 (7%)	9 (1%)	13 (2%)
Agricultural Land	11 Acres	9 (81%)	--	2 (16%)	0.3 (<1%)
Critical Infrastructure					
Utility Infrastructure	36 Assets	29 (81%)	6 (17%)	1 (3%)	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--
Hazardous Material Sites	8 Assets	7 (88%)	--	1 (13%)	--
Transportation Routes	144 Miles	120 (83%)	15 (10%)	2 (2%)	7 (5%)
Evacuation Routes	3 Miles	2.3 (89%)	--	0.1 (5%)	0.1 (5%)
Natural Infrastructure					
Forests & Shrubland	275 Acres	92 (34%)	17 (6%)	52 (19%)	113 (41%)
Wildlife Habitat Areas	475 Acres	35 (7%)	8 (2%)	35 (7%)	398 (84%)
Wetlands	370 Acres	36 (10%)	18 (5%)	11 (3%)	306 (83%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Sea Level Rise

Sea level rise is a small but growing concern for Willingboro. For this analysis, exposure to sea level rise considers the areas that may be inundated at high tide, accounting for changes in water levels for tidally-influenced rivers and waterways (such as the Rancocas Creek). This analysis looks at modeled tidal inundation scenarios at one-foot sea level rise increments, up to five feet, and identifies the extent to which assets would be exposed to tidal waters. Projections for how dramatically and how fast sea levels will rise vary. Sea level rise can also lead to more chronic flooding and worsening storm conditions, but that is not the focus of this section of the analysis. See **Section 3** for a more detailed explanation of the sea level rise hazard.

Tidal inundation driven by sea level rise is concentrated in the south, especially along the water. Across the Township, 319 acres, or 7%, of land area is modeled as exposed to present-day tidal inundation. The overall extent of sea level rise hazard exposure in the Township is low, with a significant majority of the land having no exposure to sea level rise. Around the end of the century, 10% of the land area in the township may be exposed to tidal inundation with five feet of sea level rise.

Figure 6.11.4 shows the spatial distribution of sea level rise vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by sea level rise.

FIGURE 6.11.4: Sea level rise vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

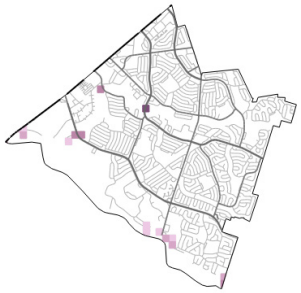


FIGURE 6.11.5: Sea level rise exposure for four themes in Willingboro Township.



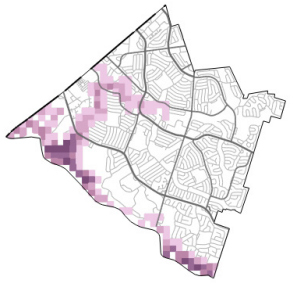
COMMUNITY RESOURCES

Structures and assets that may be exposed to tidal inundation over time usually require relocation or substantial adaptation strategies. In Willingboro, zero homes and zero public and commercial buildings would be exposed to tidal inundation at three feet of sea level rise, and 24 and four, respectively, would be exposed at five feet. These buildings are concentrated in the southwestern border and include one of the community Club Houses. Additionally, only zero acres of agricultural land are exposed to tidal inundation at five feet of sea level rise.



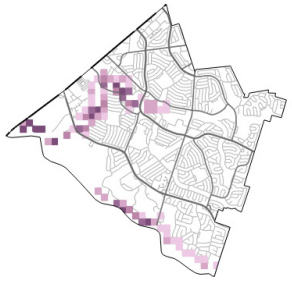
CRITICAL INFRASTRUCTURE

Sea level rise can severely impact critical infrastructure assets and systems, leaving assets unusable and disrupting critical systems. In Willingboro, zero critical infrastructure assets and 1.4 miles of roadway are exposed to 4-5 feet of tidal inundation.



NATURAL INFRASTRUCTURE

The sensitivity of natural infrastructure to sea level rise varies. Some natural landscapes, such as wetlands, have the capacity to adapt in response to changing water levels. Wetlands are known to migrate inland with rising sea levels, if space allows. However, if there is no space to allow wetlands or other natural infrastructure types to migrate, they face the risk of degradation. Around 222 acres, representing 60% of wetlands in the Township, are exposed to 4-5 feet of tidal inundation, centralized in the southwest along the Ranconcas Creek. Similarly, 46% of forests and shrublands, and 85% of wildlife habitat areas are exposed under the same conditions.



SOCIAL FABRIC

Residents living in homes directly affected by tidal inundation or chronic flooding may experience substantial physical threats and are vulnerable to severe economic losses and displacement. More broadly, people living in communities affected by sea level rise can face widespread impacts to their lives and livelihoods. This is particularly true for residents with limited economic resources and mobility. Census tracts in the southwest, especially along the shores of the Ranconcas Creek, have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering and financial loss with sea level rise.

SEA LEVEL RISE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various sea level rise exposure categories are provided in **Table 6.11.3**. Exposure categories are based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, representing the lowest sea level rise scenario to which an area or asset is exposed.

TABLE 6.11.3: Distribution of sea level rise exposure scores for land area and assets in Willingboro Township based on areas exposed to tidal flooding or designated low-lying areas with varying levels of sea level rise, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH	VERY HIGH
		No SLR Exposure	*Exposed under 4-5ft SLR*	*Exposed under 3-4ft SLR*	*Exposed under 2-3 ft SLR*	*Exposed under 1-2ft SLR*	*Exposed under 0-1ft SLR*	*Exposed under 0ft SLR*
Land Area	4,886 Acres	4,415 (90%)	32 (1%)	42 (1%)	31 (1%)	24 (<1%)	22 (<1%)	319 (7%)
Community Resources								
Residential Buildings	10,288 Assets	10,253 (99%)	10 (<1%)	14 (<1%)	--	--	--	--
Public & Commercial Buildings	710 Assets	705 (99%)	3 (<1%)	1 (<1%)	--	--	--	--
Agricultural Land	11 Acres	11 (100%)	--	--	--	--	--	--
Critical Infrastructure								
Utility Infrastructure	36 Assets	36 (100%)	--	--	--	--	--	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--	--
Hazardous Material Sites	8 Assets	8 (100%)	--	--	--	--	--	--
Transportation Routes	144 Miles	143 (99%)	0.2 (<1%)	0.3 (<1%)	0.2 (<1%)	0.2 (<1%)	0.2 (<1%)	0.2 (<1%)
Evacuation Routes	3 Miles	2.6 (98%)	--	--	--	--	--	0.04 (2%)
Natural Infrastructure								
Forests & Shrubland	275 Acres	148 (54%)	12 (4%)	10 (4%)	6 (2%)	5 (2%)	7 (2%)	87 (32%)
Wildlife Habitat Areas	475 Acres	73 (15%)	11 (2%)	11 (2%)	9 (2%)	9 (2%)	8 (2%)	354 (74%)
Wetlands	370 Acres	148 (40%)	8 (2%)	13 (4%)	14 (4%)	10 (3%)	9 (2%)	169 (46%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Heat

Willingboro Township has an overall moderate risk of extreme heat compared to other hazards. Heat can affect communities, particularly residents, both directly and indirectly. For this analysis, exposure to extreme heat is assessed using land surface temperature measurements taken in the summer of 2022, which show areas where exposure to extreme heat is relatively higher or lower due to a combination of surface materials and the urban heat island effect. Summer land surface temperatures, which are different from experienced air temperatures, typically range from about 80 to 130 degrees Fahrenheit across the Township. With climate change, average temperatures, as well as the frequency and length of heatwaves, are expected to increase over time. See **Section 3** for a more detailed explanation of the heat hazard.

Areas with the highest heat exposure in the Township are concentrated in the northern tip of the Township. These high heat areas are generally caused by high amounts of impervious surfaces and lower amounts of green space. The roadways, buildings, and built infrastructure tend to absorb and retain heat, increasing the urban heat island effect. In contrast, areas that are more rural with greater green space or higher tree canopy coverage have less heat absorption and cooler temperatures. Overall, 4% of the land area in the Township has land surface temperature classified in this study to be moderate-high or high (above 120°F), and 9% of the land area has what this study considers to be relatively low land surface temperature (less than 100°F).

FIGURE 6.11.6: Heat vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

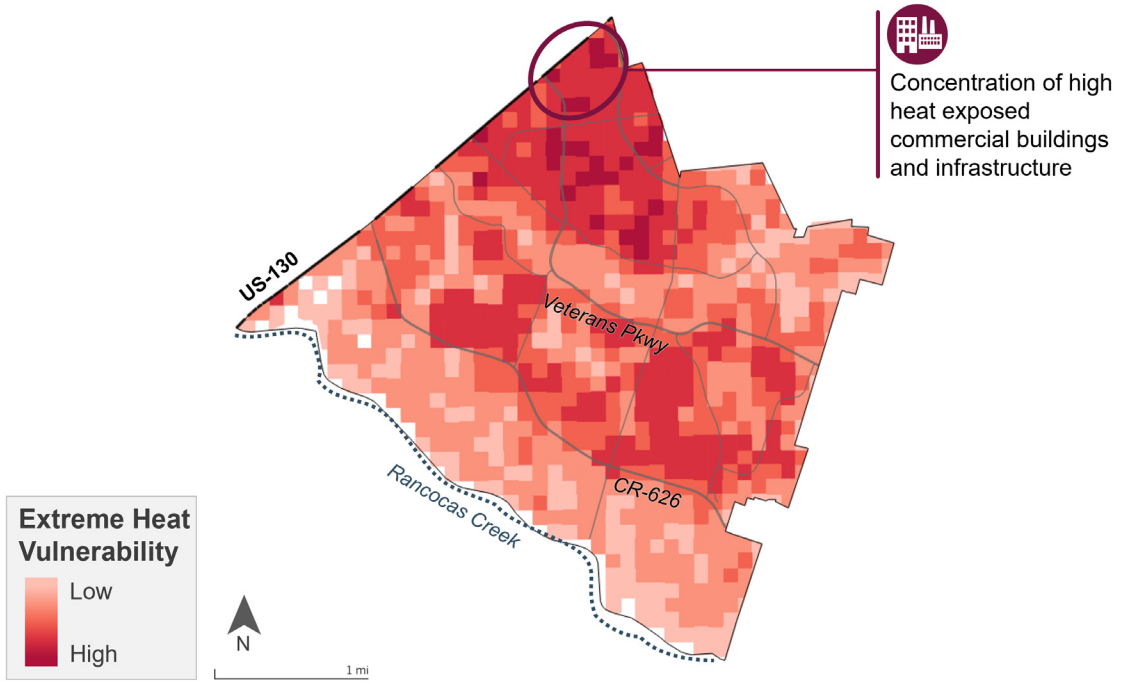
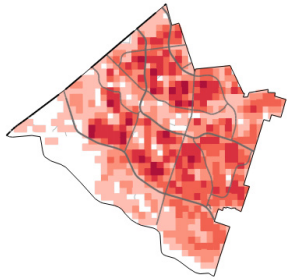


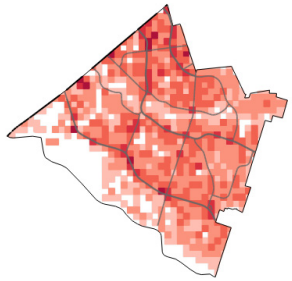
Figure 6.11.6 shows the spatial distribution of heat vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by extreme heat.

FIGURE 6.11.7: Heat exposure for four themes in Willingboro Township.



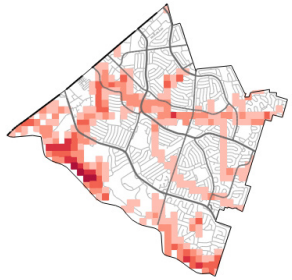
COMMUNITY RESOURCES

In Willingboro Township, less than 1% of residential buildings and 6% of public and commercial buildings have at least moderate-high heat exposure, concentrated mostly in the northern tip of the Township. Ten public or commercial buildings have particularly high measured heat exposure, including J. C. Stuart Early Childhood Development Center and Willingboro High school. While these buildings are unlikely to be directly damaged by high temperatures (e.g. the high heat will not impact the building's structural integrity or its pipes), the residents who use these buildings are also more exposed to extreme heat.



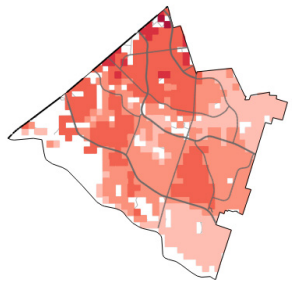
CRITICAL INFRASTRUCTURE

Critical infrastructure varies in its exposure and sensitivity to extreme heat. 11% of utility infrastructure, 33% of health and emergency services, 13% of hazardous material sites, and 6% of transportation routes in the Township have at least moderate-high heat exposure, concentrated in the north. While many critical infrastructure assets are designed to not be impacted by high temperatures, prolonged extreme heat events have the potential to stress and damage energy and transportation systems, which may cause widespread impacts on surrounding communities. Additionally, higher temperatures mean that pedestrians are more exposed to the dangerous health impacts of extreme heat.



NATURAL INFRASTRUCTURE

Compared to other asset types, natural infrastructure has a low exposure and sensitivity to extreme heat. Areas with more vegetation and water tend to create shade and promote cooling through evapotranspiration, acting as heat sinks that reduce the urban heat island effect. They therefore also tend to have lower surface and air temperatures. In Willingboro Township, 91% of forests and shrublands, 98% of wetlands, and 99% of wildlife habitat areas are classified as having moderate-low or low heat exposure (measured surface temperatures less than 110°F). These areas are mostly concentrated around Rancocas Creek and Mill Creek.



SOCIAL FABRIC

Even small differences in experienced temperatures can lead to significant impacts on human health and well-being. During extreme heat events, demographic factors such as poverty, age, and household conditions significantly affect the impacts heat can have on people. Limited access to cooling equipment due to household financial instability can amplify the impacts of high temperatures. Additionally, elderly residents are more likely to fall ill due to extreme heat. Census tracts in the north and west of the Township have higher concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during an extreme heat event.

HEAT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various heat exposure categories are provided in **Table 6.11.4**. Exposure categories are based on the measured maximum land surface temperature in the location of the area or asset.

TABLE 6.11.4: Distribution of heat exposure scores for land area and assets in Willingboro Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		<100°F Maximum Temperature	*100-110°F Maximum Temperature*	*110-120°F Maximum Temperature*	*120-125°F Maximum Temperature*	*>125°F Maximum Temperature*
Land Area	4,886 Acres	451 (9%)	1,702 (35%)	2,544 (52%)	160 (3%)	30 (1%)
Community Resources						
Residential Buildings	10,288 Assets	54 (1%)	3,018 (29%)	7,175 (70%)	41 (<1%)	--
Public & Commercial Buildings	710 Assets	10 (1%)	194 (27%)	459 (65%)	38 (5%)	10 (1%)
Agricultural Land	11 Acres	3 (31%)	3 (32%)	1 (10%)	3 (26%)	--
Critical Infrastructure						
Utility Infrastructure	36 Assets	3 (8%)	16 (44%)	13 (36%)	4 (11%)	--
Health & Emergency Services	6 Assets	--	--	4 (67%)	2 (33%)	--
Hazardous Material Sites	8 Assets	--	1 (13%)	6 (75%)	1 (13%)	--
Transportation Routes	144 Miles	1 (<1%)	34 (24%)	101 (70%)	8 (5%)	1 (1%)
Evacuation Routes	3 Miles	0.04 (2%)	0.3 (12%)	0.9 (35%)	1.3 (50%)	0.04 (2%)
Natural Infrastructure						
Forests & Shrubland	275 Acres	135 (49%)	114 (42%)	26 (9%)	--	--
Wildlife Habitat Areas	475 Acres	428 (90%)	45 (9%)	2 (1%)	--	--
Wetlands	370 Acres	236 (64%)	126 (34%)	8 (2%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Landslide

Willingboro has an overall low risk of landslides compared to other hazards, but it is still a point of concern in distinct areas. Landslides are more common in areas with steep slopes and hills or near bodies of water. They can be triggered by other hazard conditions, such as heavy rainfall or wildfire, or human activities, such as vegetation removal or construction. For this analysis, landslide hazard exposure is assessed using a model of landslide susceptibility based on factors like terrain and topography. As climate change leads to more intense storms and potential for wildfires, landslides may become more common in the future. See **Section 3** for a more detailed explanation of the landslide hazard.

The majority of landslide exposure in Willingboro is in the east, especially along the Rancocas Creek. Overall, 16% of the land area in the Township is considered exposed to landslides.

Figure 6.11.8 shows the spatial distribution of landslide vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by landslides.

FIGURE 6.11.8: Landslide vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

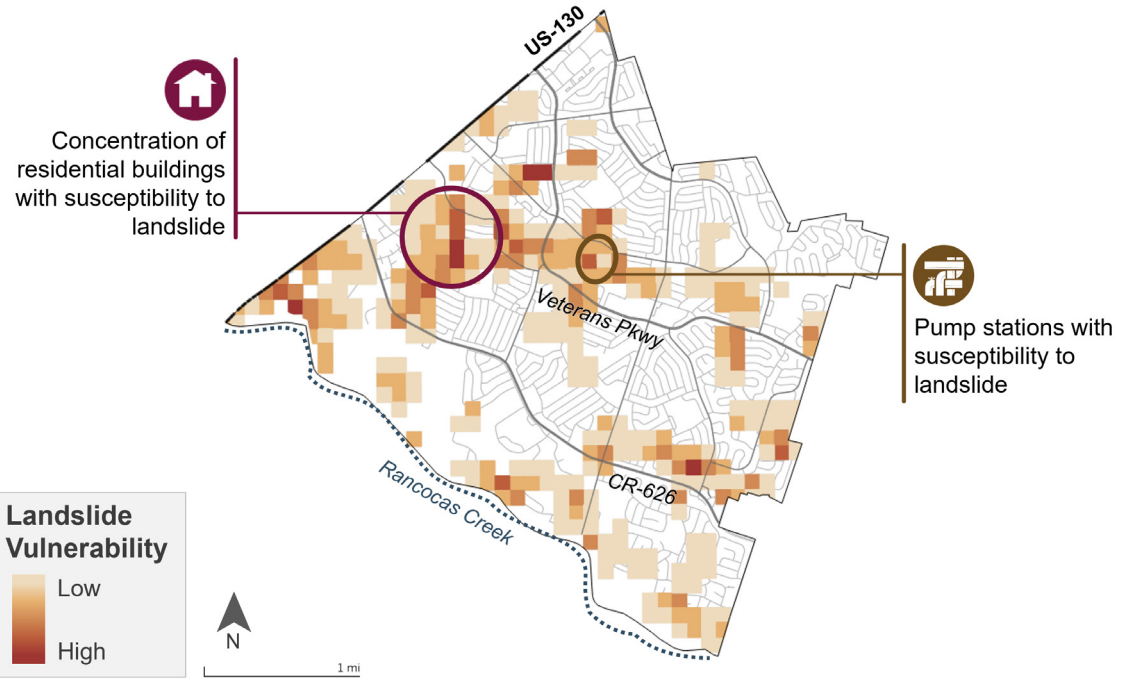
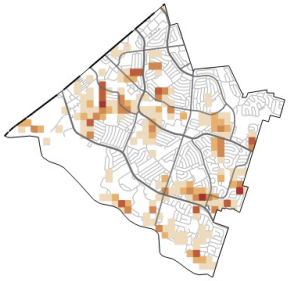
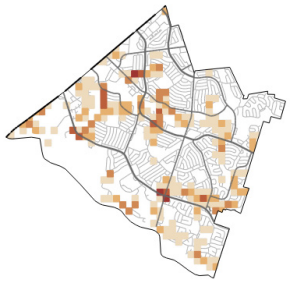


FIGURE 6.11.9: Landslide exposure for four themes in Willingboro Township.



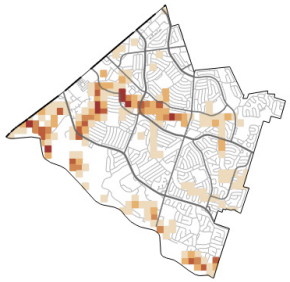
COMMUNITY RESOURCES

Landslides can severely damage or destroy buildings and agricultural assets. The majority of community resources in the Township are outside of areas modeled as susceptible to landslides. Only 9% of both residential and public and commercial buildings are in areas with at least some level of modeled landslide exposure, and 0.96% are in areas with an exposure classified as moderate or higher. These are, for the most part, concentrated along the eastern and western borders. Public structures in landslide-prone areas include the Clubhouse Community Center.



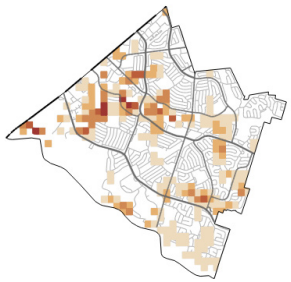
CRITICAL INFRASTRUCTURE

Landslides can damage infrastructure, but the majority of critical infrastructure in the Township is not in areas modeled as susceptible to landslides. Critical infrastructure assets with notable landslide exposure include one Land Mobile Private Tower. Landslides can also damage or block roadways, disrupting transportation systems. Roads with the highest exposure to landslides are Lake Dr, Plumtree Ln, and Springfield Ln.



NATURAL INFRASTRUCTURE

Natural infrastructure is sensitive to landslides and erosion but can also be leveraged to mitigate landslide risk. The presence of trees and vegetation can act to stabilize slopes and reduce the likelihood of landslides. Around 286 acres, or 44%, of forests, shrublands, and wetlands are in areas modeled as having some level of landslide exposure, and 6% of forests and shrubland and 5% of wetlands have between moderate and high exposure. Similarly, 117, or 25%, of wildlife habitat areas also have known landslide exposure. These areas are centered along the east.



SOCIAL FABRIC

Landslides can harm the homes and infrastructure communities rely on, and residents lacking economic resources or facing other challenges related to social vulnerability are more susceptible to human suffering during landslide events. Census tracts in the south have higher concentrations of socially vulnerable populations, and areas within those tracts with high landslide exposure include the eastern corner.

LANDSLIDE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various landslide exposure categories are provided in **Table 6.11.5**. Exposure categories are based on the modeled landslide susceptibility index score of the area where the asset is located.

TABLE 6.11.5: Distribution of landslide exposure scores for land area and assets in Willingboro Township based on modeled landslide susceptibility index scores, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No susceptibility to landslide	*Model score from 0 - 7*	*Model score from 7 - 22*	*Model score from 22- 38*	*Model score from 38 - 55*	*Model score from 55 - 81*
Land Area	4,886 Acres	4,113 (84%)	419 (9%)	295 (6%)	53 (1%)	5 (<1%)	--
Community Resources							
Residential Buildings	10,288 Assets	9,318 (91%)	564 (5%)	311 (3%)	92 (1%)	3 (<1%)	--
Public & Commercial Buildings	710 Assets	648 (91%)	47 (7%)	14 (2%)	1 (<1%)	--	--
Agricultural Land	11 Acres	9 (83%)	2 (17%)	--	--	--	--
Critical Infrastructure							
Utility Infrastructure	36 Assets	29 (81%)	5 (14%)	2 (6%)	--	--	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--
Hazardous Material Sites	8 Assets	7 (88%)	1 (13%)	--	--	--	--
Transportation Routes	144 Miles	124 (86%)	14 (10%)	5 (4%)	1 (<1%)	--	--
Evacuation Routes	3 Miles	1.9 (73%)	0.3 (11%)	0.4 (17%)	--	--	--
Natural Infrastructure							
Forests & Shrubland	275 Acres	158 (58%)	40 (14%)	62 (22%)	15 (6%)	--	--
Wildlife Habitat Areas	475 Acres	358 (75%)	49 (10%)	55 (12%)	12 (3%)	--	--
Wetlands	370 Acres	201 (54%)	83 (22%)	69 (19%)	13 (4%)	4 (1%)	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Wildfire

Willingboro has an overall moderate risk of wildfire compared to other hazards, as developed and undeveloped areas alike have the potential to burn. In this analysis, exposure to wildfire is measured by looking at the wildfire burn probability (the probability of a wildfire burning in any given year) of an asset or area. This is assessed through fire behavior modeling across thousands of simulations of possible fire seasons and considering factors like weather, topography, ignitions, and land cover. See **Section 3** for a more detailed explanation of the wildfire hazard.

While the probability of wildfire in Willingboro is not particularly high, wildfires are more likely in surrounding areas, such as the Southeastern parts of Burlington County. Even if the infrastructure in Willingboro is not affected directly by fire, surrounding fires can still have severe impacts on residents, such as disruptions to essential services and worsened air quality.

Wildfire potential in Willingboro is highest in the south along Rancocas Creek. These areas of relatively higher wildfire hazard potential are mostly forest, wildlife habitat areas, and wetlands, with a small number of agricultural lands as well. As temperatures rise and precipitation patterns change, these areas will likely be more vulnerable to wildfires. Less than 1% of the land area in the Township has an annual likelihood of burning of 0.05% or greater, which is classified as either moderate-high or high in this analysis.

Figure 6.11.10 shows the spatial distribution of wildfire vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by wildfire.

FIGURE 6.11.10: Wildfire vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

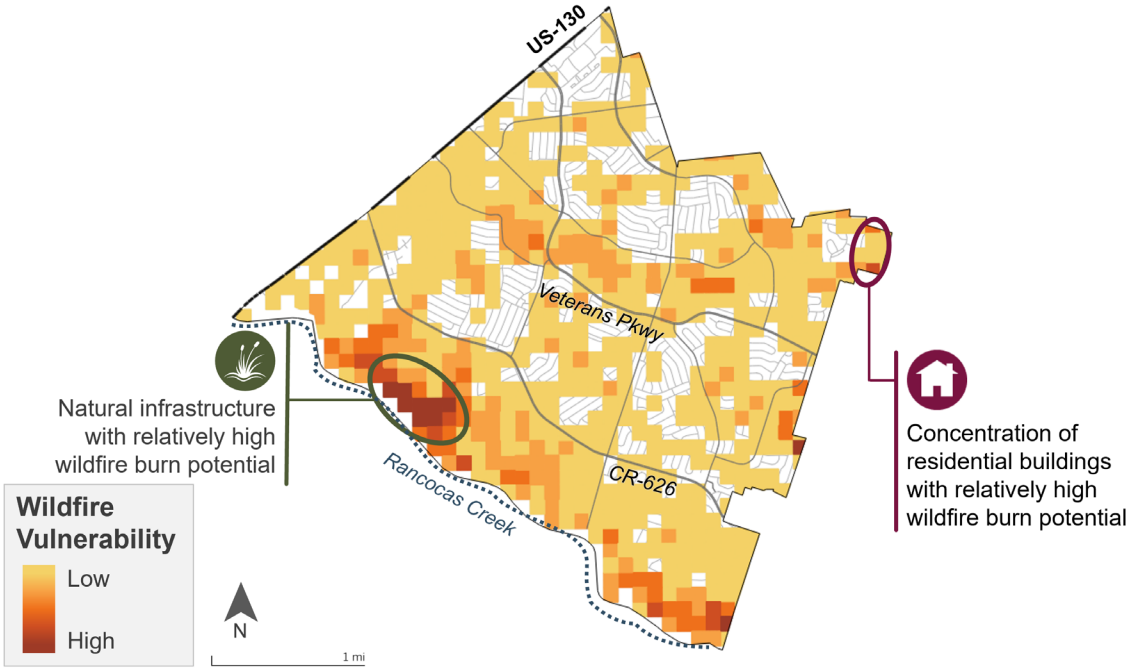
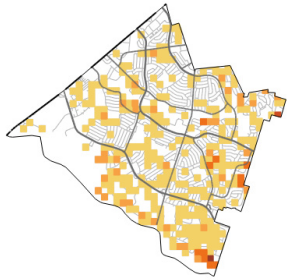
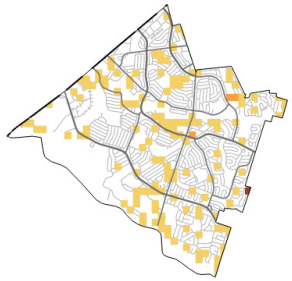


FIGURE 6.11.11: Wildfire exposure for four themes in Willingboro Township.



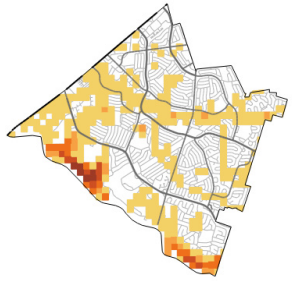
COMMUNITY RESOURCES

Wildfires have the potential to devastate community resources, burning buildings and agricultural areas alike, leading to widespread destruction and displacement. Most buildings in Willingboro are outside of areas considered exposed to wildfire. Buildings in areas nearest to undeveloped open spaces, vegetated areas, and forests are most likely to face risk of wildfire exposure, such as in the northeast. Areas with higher density urban development, meanwhile, have lower exposure. Less than 1% of buildings and no agricultural lands have an annual likelihood of burning of at least 0.05%. Agricultural land is also most exposed when adjacent to naturalized areas, such as those found in the west.



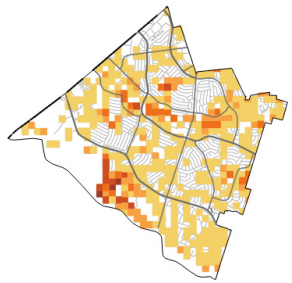
CRITICAL INFRASTRUCTURE

Critical infrastructure assets may be severely damaged if caught in a wildfire, leading to long-term and widespread disruption of services. Most critical infrastructure assets in the Township do not have any known wildfire hazard exposure. Critical infrastructure assets in more wildfire-prone areas include two pumping stations and a grocery store on JFK Way. Roadways in more wildfire-prone areas include Eastbrook Ln, East River Dr, and Genesee Ln. Roads are less likely to be directly damaged by fire, but they may serve as critical evacuation routes in the event of a wildfire.



NATURAL INFRASTRUCTURE

Forests and shrublands, wetlands, and wildlife habitat areas have more wildfire hazard exposure compared to other asset types. Forests and shrublands in the northeast, wetlands within the northeast, and most of the shore on the southwest have relatively higher wildfire exposure. Forests and shrublands tend to exhibit high sensitivity to wildfire, while wetlands are normally moist, leading to lower sensitivity to wildfire. However, dry periods caused by seasonal variation or changing drainage or climate conditions can lead to increased fire susceptibility of wetlands and other natural infrastructure.



SOCIAL FABRIC

If wildfires touch Willingboro communities directly, they can lead to lost homes, lives, and livelihoods. Residents with lower income, no home insurance, or limitations in their ability to evacuate (such as not owning a car) are more vulnerable to these impacts. Wildfires outside of Willingboro in the surrounding areas can still cause harm to Willingboro residents. Children, the elderly, and people with underlying conditions may be more sensitive to air quality impacts and disruptions to critical services. Census tracts in the southwest have some of the highest concentrations of socially vulnerable populations, indicating that those communities are more susceptible to human suffering during a wildfire event.

WILDFIRE EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various wildfire exposure categories are provided in **Table 6.11.6**. Exposure categories are based on the modeled burn probability of the area where the asset is located.

TABLE 6.11.6: Distribution of heat exposure scores for land area and assets in Willingboro Township based on measured maximum surface temperatures, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	MODERATE-HIGH	HIGH
		No burn probability	*0-0.02% burn probability*	*0.02-0.03% burn probability*	*0.03-0.05% burn probability*	*0.05-0.07% burn probability*	*> 0.07 burn probability*
Land Area	4,886 Acres	3,604 (74%)	322 (7%)	562 (11%)	392 (8%)	7 (<1%)	--
Community Resources							
Residential Buildings	10,288 Assets	9,674 (94%)	144 (1%)	306 (3%)	157 (2%)	7 (<1%)	--
Public & Commercial Buildings	710 Assets	654 (92%)	17 (2%)	25 (4%)	13 (2%)	1 (<1%)	--
Agricultural Lands	11 Acres	1 (7%)	3 (31%)	--	7 (72%)	--	--
Critical Infrastructure							
Utility Infrastructure	36 Assets	29 (81%)	2 (6%)	3 (8%)	2 (6%)	--	--
Health & Emergency Services	6 Assets	6 (100%)	--	--	--	--	--
Hazardous Material Sites	8 Assets	8 (100%)	--	--	--	--	--
Transportation Routes	144 Miles	136 (95%)	3 (2%)	4 (3%)	1 (1%)	--	--
Evacuation Routes	3 Miles	2.5 (96%)	0.1 (4%)	--	--	--	--
Natural Infrastructure							
Forests & Shrubland	275 Acres	41 (15%)	97 (35%)	51 (19%)	83 (30%)	3 (1%)	--
Wildlife Habitat Areas	475 Acres	208 (44%)	3 (1%)	55 (12%)	209 (44%)	--	--
Wetlands	370 Acres	32 (9%)	57 (15%)	155 (42%)	125 (34%)	--	--

Note: *All percentages are rounded and totals may not add up to 100%.*

Drought

Willingboro Township has an overall low risk of drought compared to other hazards, but it can still affect community assets and resources both directly and indirectly. Exposure to drought impacts varies across the landscape, and for this analysis, hazard exposure is assessed by looking at the soil landscapes, using a model that measures their sensitivity to drought conditions and ability to capture and retain moisture during a dry period. The analysis of overall drought vulnerability considers these soil conditions as well as each asset's location, sensitivity, and adaptive capacity in order to identify areas most likely to be impacted by drought. With rising temperatures and shifting precipitation patterns, Burlington County is expected to see a very modest increase in drought conditions over the next century. See **Section 3** for a more detailed explanation of the drought hazard.

Most of the land in Willingboro Township ranges from slightly drought vulnerable to drought vulnerable land. A third of the land area in the Township (33%) is drought vulnerable, with low water and nutrient-holding capacity soils. The drought-vulnerable soil landscapes in Willingboro Township is concentrated in the north and northwest portions of the Township.

Figure 6.11.12 shows the spatial distribution of drought vulnerability across the Township, highlighting areas where assets and populations are most exposed and likely to be adversely affected by drought.

FIGURE 6.11.12: Drought vulnerability index displayed using 500 ft x 500 ft grid cells and identified Focus Areas in Willingboro Township.

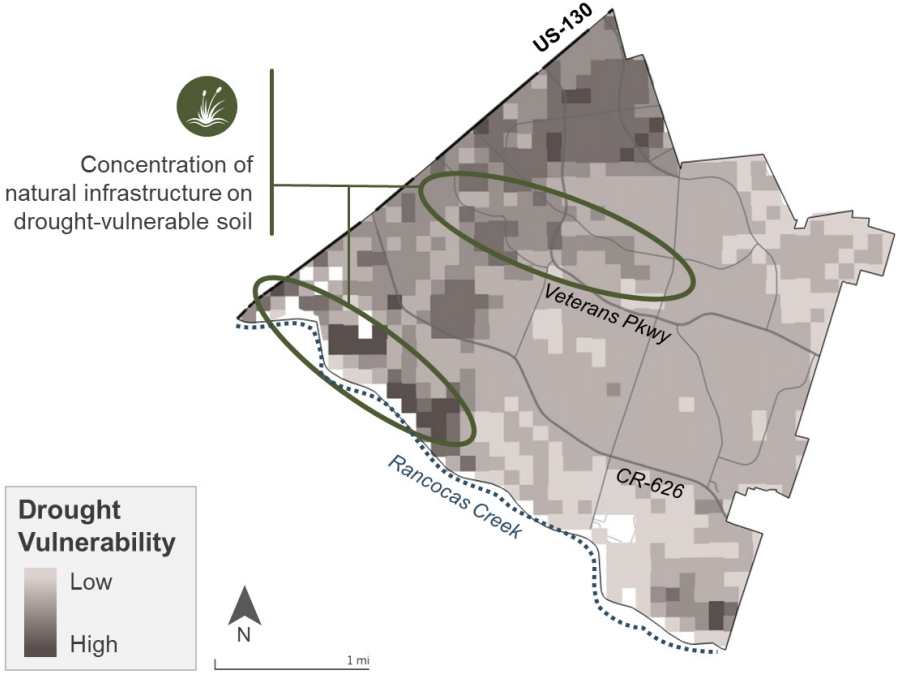
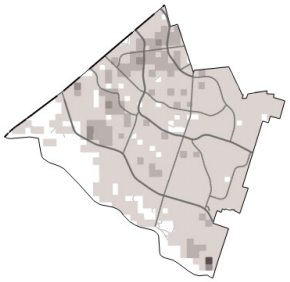
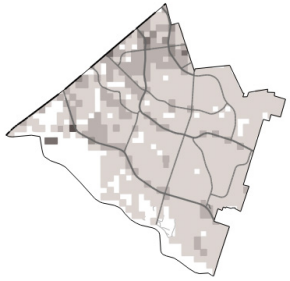


FIGURE 6.11.13: Drought exposure for four themes in Willingboro Township.



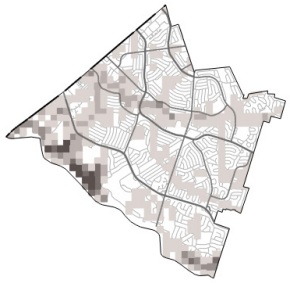
COMMUNITY RESOURCES

Agricultural land is sensitive to drought as the depletion of water availability in soil can cause significant declines in crops and livestock productivity, with potential for widespread economic impacts. Around 95% of agricultural land in the Township is on highly drought-vulnerable soil, with a small plot of land in the northwest and another in the south. Around a fifth of buildings (22%) are also on land modeled to be drought-vulnerable, concentrated mostly in the north and northwest. However, these buildings are considered less sensitive to drought, as they are unlikely to experience direct physical damage or harm due to drought.



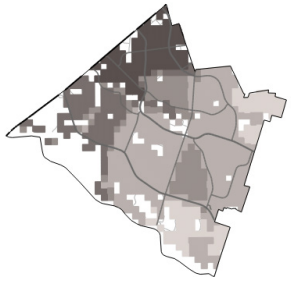
CRITICAL INFRASTRUCTURE

Nearly half of critical infrastructure assets in the Township are on drought-sensitive soil. Between 33% and 75% of utility infrastructure, health and emergency services, and hazardous material sites are on these drought-vulnerable lands, concentrated in the north and northwest. However, these assets may not be directly sensitive to harm from drought. Drought impacts on critical infrastructure are mostly indirect, such as putting strain on the water and energy sectors. In extreme drought conditions, land subsidence due to depleted groundwater can lead to damaged roads and other structures.



NATURAL INFRASTRUCTURE

Most natural infrastructure has some natural resilience to drought, as it is able to absorb and retain excess water during wet periods and slowly release it during dry periods. However, extreme or prolonged changes in rainfall patterns and water levels can disrupt hydrologic functions of wetlands and lead to changes in soil chemistry, vegetation growth, and plant communities that may impact all types of natural infrastructure. Additionally, drought is associated with increased wildfire risk in vegetated areas. In Willingboro Township, 29% of wetlands and 68% of forests and shrublands are modeled to have drought-vulnerable soil, concentrated in the northwest corner of the Township.



SOCIAL FABRIC

Drought in this area is unlikely to lead to direct physical harm to people or communities, but can indirectly lead to financial, physical, and mental stress. Residents who are more financially strained or work in drought-sensitive occupations (such as agriculture) may suffer the consequences of drought more than others as water shortages lead to higher utility costs and strains on infrastructure systems. Census tracts in the northwest have higher rates of poverty and other social vulnerability factors, indicating that those communities are more susceptible to human suffering during a drought event.

DROUGHT EXPOSURE STATISTICS

Summary statistics for the areas and assets that fall into various drought exposure categories are provided in **Table 6.11.7**. Exposure categories are based on the modeled soil drought vulnerability of the area where the asset is located.

TABLE 6.11.7: Distribution of drought exposure scores for land area and assets in Willingboro Township based on soil drought vulnerability, grouped by theme.

ASSET TYPE	TOTAL	NO EXPOSURE	LOW	MODERATE-LOW	MODERATE	HIGH
		Soil Not Rated	*Slightly Drought-Vulnerable Soil*	*Somewhat Drought-Vulnerable Soil*	*Moderately Drought-Vulnerable Soil*	*Drought-Vulnerable Soil*
Land Area	4,886 Acres	80 (2%)	110 (2%)	2,919 (60%)	162 (3%)	1,616 (33%)
Community Resources						
Residential Buildings	10,288 Assets	126 (1%)	172 (2%)	7,709 (75%)	50 (<1%)	2,231 (22%)
Public & Commercial Buildings	710 Assets	11 (2%)	8 (1%)	446 (63%)	15 (2%)	230 (32%)
Agricultural Lands	11 Acres	--	226 (18%)	1 (4%)	--	10 (95%)
Critical Infrastructure						
Utility Infrastructure	36 Assets	1 (3%)	2 (6%)	18 (50%)	--	15 (42%)
Health & Emergency Services	6 Assets	--	--	4 (67%)	--	2 (33%)
Hazardous Material Sites	8 Assets	--	--	--	2 (20%)	6 (75%)
Transportation Routes	144 Miles	2 (1%)	2 (1%)	97 (67%)	1 (1%)	42 (29%)
Evacuation Routes	3 Miles	--	--	--	--	3 (100%)
Natural Infrastructure						
Forests & Shrubland	275 Acres	4 (1%)	1 (<1%)	64 (23%)	19 (7%)	188 (68%)
Wildlife Habitat Areas	475 Acres	82 (17%)	139 (29%)	4 (1%)	5 (1%)	246 (52%)
Wetlands	370 Acres	6 (2%)	80 (21%)	109 (29%)	69 (19%)	107 (29%)

Note: *All percentages are rounded and totals may not add up to 100%.*

Planning Analysis

For long-term community resilience, it is critical to connect climate change vulnerability with planning and policy as well as local land development. This section provides an examination of key planning and policy documents at the local, county, state, and regional levels (Plan Alignment), analyzes developable area in the municipality (Buildout Analysis), looks at redevelopment areas (Redevelopment Areas), and discusses the municipality's commitments to meeting its affordable housing needs (DCA's Round IV of Affordable Housing).

Plan Alignment

Previously, Willingboro Township's planning documents focused on sustainability and environmental protection, not climate change resilience. However, the Township is currently undertaking a CCRHVA component in its Master Plan update. This effect is running in parallel with this CCRHVA. Climate change concerns have also been addressed in State and county initiatives. Some notable plans, policies, and studies are highlighted below.

LOCAL EFFORTS

- The 1990 Master Plan highlights preserving natural features and creating open space for recreation, with a focus on integrating stream corridors and maintaining public access. It designates environmentally sensitive areas, such as floodplains and wetlands, under the Recreation and Conservation (R/C) zone to prevent development and protect natural resources. The plan also promotes pedestrian and bicycle infrastructure to encourage alternative transportation.
- The 1997 Master Plan continues this focus on open space preservation and pedestrian connectivity. It encourages the integration of recreational spaces and the establishment of pedestrian linkages between parks, open space, and community facilities.
- The Willingboro Township Municipal Stormwater Management Plan was adopted in February 2005 to meet NJDEP regulatory standards. The plan addresses runoff quantity, water quality, and recharge through structural and non-structural best practices. It was revised in November 2007. In the 2006 Master Plan Reexamination, the Township recognized the need to revitalize its waterfront areas. The plan calls for studying underutilized waterfront properties for potential development, respecting the required balance for waterfront development by promoting a mix of public open space, residential, and commercial uses while maintaining public access to the Rancocas Creek.
- One of the more substantial Master Planning documents that addresses climate change came in the Township's 2012 Green Buildings and Environmental Sustainability Plan Element, which focuses on sustainability goals, including the reduction of dependence on fossil fuels, the use of renewable energy, and the adoption of innovative stormwater management practices. Key objectives include promoting mixed-use development, fostering community gardens, and supporting the use of green infrastructure like rain gardens and porous pavement.
- Chapter 175, Flood Damage Prevention, amended in its entirety on November 21, 2017, by Ordinance No. 2017-12, reflects Willingboro Township's ongoing commitment to managing flood risks.

The chapter regulates development activities within designated flood hazard areas to protect life, property, and community welfare. It also designates the Floodplain Administrator as the official responsible for interpreting the ordinance and ensuring compliance with both local standards and NJDEP regulations.

- The 2018 Master Plan Reexamination highlights the importance of sustainable development, recommending the adoption of an updated Green Buildings and Environmental Sustainability Plan to address more than current concerns, as the 2012 Green Buildings and Environmental Sustainability Plan did not address climate change directly. It also recommends incorporating smart growth principles, promoting renewable energy, and enhancing stormwater management practices.

COUNTY EFFORTS

- In 2024, the county-wide HMP was updated. According to the 2024 Burlington County HMP, Willingboro Township has a high hazard rating for severe weather; medium ratings for disease outbreak, extreme temperatures, and severe winter weather; and low ratings for dam failure, drought, earthquake, flood, and wildfire. The Township demonstrates a strong adaptive capacity in dealing with disease outbreaks, extreme temperatures, and severe winter weather; and a moderate capacity in dealing with dam failure, drought, earthquake, flood, severe weather, and wildfire.

STATE EFFORTS

- NJDEP's 2014 CVI finds that there are highest-risk and moderate-risk areas throughout the Township, concentrated along the Rancocas Creek and Millcreek. Several schools are located in moderate-risk areas, and the Cathedral of Love Preschool and Academy is located in a higher-risk area adjacent to Millcreek. There is a significant moderate-risk area in the eastern portion of the Township, with the more inland areas of the Township having a lower-risk classification.

Buildout Analysis

This municipality has very limited land remaining for new development. The buildout estimates that follow illustrate a hypothetical, high-end scenario of redevelopment potential based on zoning capacity, and should be interpreted as a planning tool rather than an expected outcome. Willingboro Township's zoning framework is rooted in its origin as one of the most prominent post-war planned communities in New Jersey. The Township's R-1 Residential District represents the core

FIGURE 6.11.14: The School House in Willingboro *(Source: Jerrye and Roy Klotz, MD, Wikimedia Commons, CC-BY-SA-4.0)*



of a Levittown-style development, built extensively in the 1950s and '60s by Levitt & Sons. This planning model resulted in a uniform, large-scale subdivision that continues to define the Township's residential landscape and contributes to its overall development capacity.

Residential zoning in Willingboro comprises multiple sub-districts, including conventional single-family neighborhoods, planned unit developments, and restricted residential zones. Minimum lot areas range from 6,500 square feet in the R-1 and R-1A zones to 12,000 square feet in the R-1B Planned Unit Residential Development District. Commercial and professional zones support neighborhood centers and institutional uses, while the Township's single industrial district carries a one-acre minimum.

Willingboro is one of the few municipalities within the Study Area which carries density standards for specific zoning districts. For residential uses, this comes in the form of a Maximum Residential Density measured by Dwelling Units (DUs) per Acre. For Nonresidential Uses, this comes in the form of a Maximum Floor-Area Ratio (FAR), which is a measurement for comparing the ratio of building gross floor area (GFA) to the overall area of the lot upon which such a building sits. FARs are typically used in nonresidential zoning districts to contain intensity of those nonresidential uses, and function similarly to that of residential density maximums. Those applicable

TABLE 6.11.8: Willingboro Township zoning areas and square footage.

ZONE	SQUARE FEET
Residential Zones' Minimum Lot Areas	
R-1 (Residential District)	6,500 square feet
R-1A (Restricted Residential District)	6,500 square feet (8.0 DU/Acre Maximum Residential Density)
R-1B (Planned Unit Residential Development District)	12,000 square feet (3.9 DU/Acre Maximum Residential Density)
R-2 (Residential District)	8,000 square feet (2.9 DU/Acre Maximum Residential Density)
R-3 (Residential District)	8,000 square feet (2.5 DU/Acre Maximum Residential Density)
Commercial Zones' Minimum Lot Areas	
A-1 (Administrative and Professional District)	20,000 square feet
B-1 (Primary Business District)	40,000 square feet – 0.5 Maximum FAR
B-2 (Planned Neighborhood Business Center District)	348,480 square feet (8 acres)
B-3 (Tertiary Business District)	20,000 square feet
Industrial Zones' Minimum Lot Area	
I-1 (Restricted Industrial District)	43,560 square feet (1 acre)

TABLE 6.11.9: Willingboro Township buildout analysis results.

MUNICIPAL ZONING DISTRICT CODE	CURRENT NO. OF PARCELS IN ZONE	TOTAL SQUARE FEET OF DEVELOPABLE LAND IN ZONE	TOTAL ACRES OF DEVELOPABLE LAND IN ZONE	MINIMUM LOT AREA BY ZONE (SQUARE FEET)	TOTAL POSSIBLE NO. OF LOTS AS COMPLETE BUILDOUT*
A-1	2	126,782.81	2.91	20,000	6
A-1	1	44,764.63	1.03	20,000	2
A-1	7	482,849.15	11.08	20,000	24
B-1	6	268,243.26	6.16	40,000	7
B-1	77	9,122,077.65	209.41	40,000	228
B-2	27	369,943.81	8.49	348,480	1
B-2	3	343,747.09	7.89	348,480	1
B-2	5	474,978.90	10.90	348,480	1
B-2	6	292,387.11	6.71	348,480	1
B-2	25	269,735.36	6.19	348,480	1
B-3	2	62,872.98	1.44	20,000	3
B-3	1	20,540.32	0.47	20,000	1
B-3	3	96,708.21	2.22	20,000	5
B-3	1	19,875.72	0.46	20,000	1
B-3	2	63,403.52	1.46	20,000	3
B-3	2	44,641.08	1.02	20,000	2
B-3	2	54,355.86	1.25	20,000	3
B-3	2	45,180.10	1.04	20,000	2
I-1	42	2,075,609.40	47.65	43,560	48
R-1	8,203	69,213,790.91	1,588.93	6,500	10,648
R-1	1	169,552.89	3.89	6,500	26
R-1A	631	2,439,353.34	56.00	6,500	375
R-1B	119	680,278.84	15.62	12,000	57
R-2	863	10,798,831.94	247.91	8,000	1,350
R-3	438	11,152,194.68	256.02	8,000	1,394

* *Maximum buildout hypothetical*

zoning maximums and the zones for which they apply are included below. **Table 6.11.8** displays the zones and the square footage.

After accounting for environmental constraints, preserved lands, and non-traditional development types such as planned unit developments and historic subdivision configurations, the amount of land available for new subdivision can be totaled. Willingboro Township contains 10,471 parcels and/or land masses across all zoning districts which do not face those restrictions above and has an estimated 108,700,000 square feet (or 2,500 acres) of unconstrained land capable of a complete buildout. These values represent the base land inventory prior to applying site-specific limitations and serve as a starting point for calculating theoretical buildout capacity using the zones' minimum lot area requirements.

The buildout analysis for Willingboro Township projects the greatest nonresidential capacity within the B-1 Primary Business district along the border with Edgewater Park, as shown in **Table 6.11.9**. This district is also noted for its maximum permitted FAR in the zone, which is 0.5. By this maximum, the zoning for Willingboro permits a theoretical 4.72 million square feet of nonresidential floor area in the zone, which translates to over 20,000 square feet per possible lot in the zone (possible lots accounting for a subdivision of the land by the minimum lot area). This is significant, as it is an indicator that should a Township-wide redevelopment pattern or trend begin, the B-1 Zone in that location of the Township could see the most growth.

Residential capacity analysis shows that the R-1 and R-3 Zones could see intensity or expansion should a complete buildout occur. In the R-1 Zone, the potential for buildout stems from the possible number of lots compared to the existing number, with the possible number of lots being over 10,000 while there are currently 8,200 in the zone. The R-1 zone encompasses a large, conventionally designed historic subdivision, and this high capacity likely reflects a significant number of existing

FIGURE 6.11.15: Lake at Millcreek Park in Willingboro. *(Source: WBNJnews, Wikimedia Commons, CC-BY-SA-4.0)*



TABLE 6.11.10: Willingboro Township buildout analysis results with maximum residential dwelling units / acre and maximum floor-area-ratio..

ZONING DISTRICT CODE	SQUARE FEET AVAILABLE	ACRES AVAILABLE FOR DEVELOPMENT	MAX. RESIDENTIAL DWELLING UNITS PER ACRE	MAX. POSSIBLE DWELLING UNITS	MAX. FLOOR-AREA RATIO	MAX. NON-RESIDENTIAL FLOOR AREA
B-1	9,390,320.91	215.57	--	--	0.5	4,857,341.52
R-1A	2,439,353.34	56.00	8	656	--	--
R-1B	680,278.84	15.62	3.9	78	--	--
R-2	10,798,831.94	247.91	2.9	850	--	--
R-3	11,152,194.68	256.02	2.5	741	--	--

parcels that exceed the minimum lot area requirement. While this over 2,000-lot increase may seem somewhat significant or likely, this analysis should be interpreted cautiously and viewed as a zoning-based theoretical exercise.

The lone R-3 zone in the Township also appears to have capacity for future growth. This buildout, however, is capped by the residential density maximum in place for the zone, being 2.5 units per acre. While an analysis yields a potential for nearly 1,400 lots in the R-3 zone, the maximum residential density only permits up to 741 dwelling units in the entire zone. Thus, any potential for future growth in the R-3 zone would require "D" Variance relief and is unlikely to occur at such a high volume. In an analysis of the other residential zones in Willingboro that also have residential density maximums, namely the R-1A, R-1B, and R-2 zones, it is clear that the maximum number of dwelling units permitted is less than the possible maximum based on land mass area. Thus, the density standards are more of a governing factor than solely minimum lot area. (See **Table 6.11.10**.)

Overall, while Willingboro Township's buildout analysis yields a potential net increase of residential lots, the historic development patterns and established residential maximum densities may hinder a comprehensive and complete buildout. This numerical increase in lots is heavily driven by capacity projections in residential zones, particularly R-1. As with other compact and conventionally developed municipalities, the prevalence of small minimum lot area requirements combined with variation in existing parcel sizes contributes to a skew in buildout projections.

Note the results of this analysis likely skew towards an overestimation of redevelopment potential in commercial/ industrial areas where large lots can have multiple/large buildings and the areas may be fairly built-out from a square footage perspective, even if zoning would allow the lots to be subdivided.

REDEVELOPMENT AREAS

As the Township prepares for increased climate risks and intensifying environmental hazards, understanding where development is technically feasible provides valuable insight. High-capacity residential zones, small-lot overlays, and

historically overbuilt districts may be especially susceptible to flood exposure, heat stress, or stormwater impacts. It is important to balance development with climate resilience, especially in areas where zoning may unintentionally amplify risk. The township has a few identified redevelopment areas. Current and future vulnerabilities and risks should be a consideration in redevelopment efforts, including avoiding development in the most flood-prone areas and implementing flood mitigation strategies for buildings and infrastructure within both present and future mapped floodplains. Additionally, any areas that tend to experience higher temperatures due to the urban heat island effect should be mitigated with future redevelopment efforts that incorporate more vegetation, shade, and trees.

The township has a few redevelopment areas noted.

- Along Rt 130 corridor, near former Big D Marina, by the old Marina and boat launch.
- Affordable and market-rate housing at the old Burlington Times property.
- Grand Market Place redevelopment.

ROUND IV OF AFFORDABLE HOUSING

The DCA determined the Round 4 Present Need of 16 and a Prospective Need for Willingboro Township of 77 units of affordable housing. Through Resolution 2025-37, the Township accepted DCA's number. The Township prepared an HEFSP outlining various mechanisms to address their Round IV Obligation, including a proposed 100% affordable development, inclusionary development, and supportive needs housing. The HEFSP was adopted by the Planning Board on June 9, 2025, through Resolution 2025-07, and endorsed by the Governing Body on June 17, 2025, through Resolution 2025-169.

The Township is pursuing an Area in Need of Redevelopment designation for the former Burlington County Times site, also known as Block 5.02, Lots 8, 9, 10, 11, and 17. The site will include two affordable housing projects: a 100% affordable project of 60 family rental units and an inclusionary townhome project. The 100% affordable project is proposed to be constructed on 3.56 acres, with frontage along Route 130. The inclusionary development component of the proposal is proposed to be constructed on the back 12.65 acres of the 16-acre former Burlington County Times site and will include at least 125 for-sale townhomes. There are limited wetlands and 500-year flood hazard areas located on the western portion of the site. A site suitability analysis is included in the appendices of the HEFSP. Additional details regarding the site design will be developed in the future, and the appropriate regulatory approvals, including NJDEP approval, will be sought where and when appropriate.

Resilience Strategy

Willingboro Township's resilience strategy addresses both current and future climate change impacts. This section includes a policy statement to guide the municipality as well as resilience actions the municipality would like to pursue.

Policy Statement

A policy statement was developed to comply with MLUL requirements. This statement builds upon the vulnerability assessment, outreach, previous planning commitments, and resilience actions developed by Willingboro Township.

Willingboro Township seeks to strengthen its economy while advancing climate resilience through sustainable redevelopment of vacant and underutilized sites. Leveraging the River LINE light rail supports compact, transit-oriented growth that reduces emissions. The Township prioritizes enhancing and protecting waterfront areas, balancing new development with public open space to address flooding and environmental risks. Revitalizing key gateways and improving transportation infrastructure aim to reduce congestion and pollution. Willingboro is committed to crafting a future vision that integrates climate adaptation and sustainability into land use and redevelopment planning.

Resilience Actions

In order to provide a springboard for increasing community resilience, resilience actions were developed to address key risks faced by the community and risks identified by the vulnerability assessment, in compliance with the State's MLUL. Actions may address more than one hazard and actions may be physical actions (e.g., a capital improvement) or policy and planning actions (e.g., a program undertaken by a community), or both, depending on how they are implemented. Actions also vary in a municipality's authority to implement. In some instances, an action may be regional -- best implemented if municipalities work together or with outside partners.

Resilience actions described in the following pages use the frameworks defined below. Regional resilience actions are summarized at a higher level. Images are included for example purposes.

WILLINGBORO TOWNSHIP RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Responsible Party:** The organization, department, or agency that would lead and take ownership of implementation.
- **Estimated Costs:** Tentative estimate of the cost of the action, based on projects of similar type and scale.
- **Possible Source(s) of Funding:** How the action could be funded (capital programs, grants, etc.).
- **Estimated Timeline:** Tentative estimate of when implementation could begin.
- **Priority Rating:** Relative priority of the action in relation to other actions.

REGIONAL RESILIENCE ACTIONS

- **Description:** Brief summary of the action.
- **Potential Partner:** An organization, department, or agency that could work with a locality to implement an action.



WILLINGBORO TOWNSHIP RESILIENCE ACTION

Improve Local Drainage Infrastructure

There is an active local beaver population that contributes to blockages in the stormwater infrastructure, which threatens drainage and increases flooding in surrounding neighborhoods. Since relocation of the beaver population is not permitted, engineered interventions are required to protect municipal infrastructure. This action would install beaver exclusion and flow control systems at three critical locations.

RESPONSIBLE PARTY Willingboro Township

ESTIMATED COSTS $1M

POSSIBLE SOURCE(S) OF FUNDING I-Bank



ESTIMATED TIMELINE

1 year

PRIORITY RATING

★★★★★

High

WILLINGBORO TOWNSHIP RESILIENCE ACTION

Neighborhood Scale Drainage Study

During periods of high water in nearby waterways, such as Rancocas Creek, Mill Creek, and surrounding tributaries, the community's drainage systems become blocked, preventing stormwater from discharging properly. This causes stormwater backup in streets, leading to localized flooding. The Township seeks to do a neighborhood-scale drainage improvement study to identify projects that would increase local storage and infiltration capacity, reduce peak flows, and improve the overall performance of the drainage network. These can include green infrastructure and nature-based solutions where possible.

RESPONSIBLE PARTY Willingboro Township

ESTIMATED COSTS $100K - $5M

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-5 years

PRIORITY RATING

Medium

WILLINGBORO TOWNSHIP RESILIENCE ACTION

Public Outreach and Education about Flood Mitigation

Institute a public information campaign to increase outreach and education for residents related to flood risk mitigation strategies they can take on their own property, as well as things they can do to decrease local flooding risk. Education topics include home retrofit options, flood insurance, and the impacts of dumping (historically, dumping of leaves and yard in local waterways has increased flooding during rainfalls).

RESPONSIBLE PARTY Willingboro Township

ESTIMATED COSTS $10K - 250K+

POSSIBLE SOURCE(S) OF FUNDING Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium

WILLINGBORO TOWNSHIP RESILIENCE ACTION

Establish a Cooling Center Program

Establish publicly accessible cooling centers during extreme heat events as part of a heat response plan. These centers provide air conditioning, water, and medical support for affected populations. The town can use schools, libraries, and community centers for this purpose.

RESPONSIBLE PARTY Willingboro Township

ESTIMATED COSTS $0 - $50K

POSSIBLE SOURCE(S) OF FUNDING Capital Funds



ESTIMATED TIMELINE

0-3 years

PRIORITY RATING

Medium

WILLINGBORO TOWNSHIP RESILIENCE ACTION

Physical and Programmatic Actions to Reduce Extreme Heat

Physical actions, such as expanding the tree canopy and installing hydration stations, and programmatic actions, such as revisiting design standards and requirements for developers to incorporate green infrastructure or other climate mitigation design standards, can be implemented to reduce impacts from extreme heat. Expansion of the tree canopy and installation of shade structures in high-heat areas can improve shade and reduce the heat island effect. Tree planting on both public and private properties can be promoted through incentive programs, volunteer planting events, and homeowner education. Installing public drinking fountains and hydration stations in parks and downtown areas is also an option. These facilities help prevent dehydration during extreme heat events. They are especially beneficial for pedestrians, cyclists, and outdoor workers. In addition, the Township will review and update its design standards to incorporate climate-sensitive features wherever possible. Examples include cool roofs, which use reflective materials to reduce heat absorption, and green roofs, which help reduce the heat island effect and absorb rainwater, improving stormwater management and overall resilience.

RESPONSIBLE PARTY	Willingboro Township
ESTIMATED COSTS	$50K - $500K
POSSIBLE SOURCE(S) OF FUNDING	Capital Funds, I-Bank, NJDEP



ESTIMATED TIMELINE

1-3 years

PRIORITY RATING

Medium



REGIONAL RESILIENCE ACTION

Continuation of Road Maintenance to Respond to Climate Change Impacts

Road maintenance, including the maintenance of roadway drainage infrastructure, can assist with reducing roadway flooding. This regional resilience action focuses on working with Burlington County and NJDOT to identify roads that can benefit from more frequent maintenance. It should focus on addressing flooding on key State (including Route 130) and County roads.

POTENTIAL PARTNERS NJDOT, Burlington County

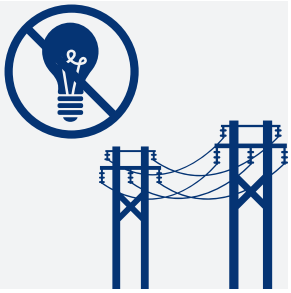


REGIONAL RESILIENCE ACTION

Stream Cleaning, Bank Stabilization, and Channel Restoration

Projected increases in rainfall and sea level rise, which result in more intense storms, pose an increased impact on waterways. These impacts may include increased debris accumulation, siltation, erosion, and scour. Maintaining a stable watercourse is important to adjacent, upstream, and downstream communities and is not dictated by municipal boundaries. Thus, a regional and/or multi-municipal approach is likely more effective. There are multiple methods for stream cleaning, bank stabilization, and channel restoration. Examples include installation of sediment control measures, installation of scour countermeasures, bank stabilization via vegetation and/or bioengineering, bank stabilization via structural methods, channel dredging, and others.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County



REGIONAL RESILIENCE ACTION

Coordinated Response to Widespread Power Outages

Severe storms with high winds or icing can cause widespread and prolonged power outages, disrupting essential services, communications, and community safety. Thus, it is critical to work with PSE&G to establish a coordinated response. This includes developing clear lines of communication between municipal officials, emergency management, and PSE&G; prioritizing restoration of critical facilities; and enhancing community preparedness through public education and backup power planning.

POTENTIAL PARTNERS Municipal OEMs, Burlington County, PSE&G



REGIONAL RESILIENCE ACTION

Expansion of NJDEP's Blue Acres Program

Homes across the Study Area are increasingly at risk of flooding due to sea level rise and more frequent, intense rainfall. The Blue Acres program provides a voluntary home buyout option that allows residents in vulnerable areas to relocate to safer locations, reducing future flood risk and protecting both people and property. Blue Acres, run by NJDEP and funded by state and federal sources, is the State's voluntary home buyout program. The Blue Acres program has worked since 1995 to protect the public by relocating New Jersey residents whose homes are repeatedly flooded or may be damaged in the future due to climate change or buffer other lands that may be damaged. Land purchased through this program will return to nature for use as natural flood storage, parks, or community open space. In buying out residents who own property repeatedly damaged by flooding, or property that will likely be impacted by flooding, and returning this land to a passive, natural use, the program protects the residents leaving their homes, as well as increases permeable surfaces, assisting in lowering the flood risk for those who remain.

POTENTIAL PARTNERS United States Army Corps of Engineers (USACE), NJDEP, NJDOT, Burlington County

SECTION 7: Conclusion

By participating in the area's first Resilient NJ multi-municipal CCRHVA, the 11 communities along Route 130 in Burlington County – Beverly City, Burlington City, Burlington Township, Cinnaminson Township, Delran Township, Edgewater Park Township, Florence Township, Palmyra Borough, Riverside Township, Riverton Borough, and Willingboro Township – have clearly demonstrated a commitment to creating resilient, strong, and healthy communities for those who live, work, and visit. For some communities, this work comes with a long history of resilience knowledge and efforts to increase municipal resilience. For other communities, resilience is a newer endeavor. However, all communities recognize the impacts of climate change and necessity to address these impacts.

The CCRHVA process, and each community's CCRHVA, plays an important role in strengthening each community's response to climate change impacts. This document provides each community with a vulnerability assessment for six different hazards as well as a buildout analysis to see which not-yet developed area may be more vulnerable to climate change hazards. Understanding vulnerability is a cornerstone of making smart, efficient investments that protect residents, workers, and visitors. Through the public and municipal staff engagement undertaken during this planning process, stakeholders' knowledge about local climate change hazards' impacts on them and their communities was broadened. Stakeholders' input actively shaped these plans – from understanding areas of vulnerability not shown in the data, to understanding what resilience means to residents, to developing resilience actions for each community that are responsive, ambitious, and practical.

The resilience actions noted in each municipality's CCRHVA provide ways to move resilience work forward. Importantly, having these actions can assist the municipalities in taking advantage of future grant opportunities. Because climate change impacts – flooding, sea level rise, high heat days, and so on – know no municipal borders, one particularly valuable aspect of this multi-municipal process is its multi-community approach. Through the CCRHVA process, municipalities shared current best practices and some lessons learned. Conversations were had about how a resilience solution, such as enlarging a stormwater pipe, for one municipality may negatively impact another, such as increasing the volume of stormwater in the neighboring community. In addition to implementing the resilience actions, continued regional coordination is critical to advancing resilience. Best practices

and lessons learned should continue to be shared across communities, increasing knowledge. As the regional actions show, communities can partner together to work with federal or state agencies, making solutions more efficient and effective. And, municipalities can continue to meet with each other, approaching resilience on a community and regional level.

As this CCRHVA has shown, creating resilient communities is not a "one and done" process but rather an on-going process with twists, turns, setbacks and advances. It is difficult work – but it is critical work. And, it is work that these 11 communities are prepared to do.

FIGURE 7.11.1: View at the intersection of Route 130 and County Route 543 (Beverly Rd) in Burlington Township. *(Source: Famartin, Wikimedia Commons, CC-BY-SA-4.0)*





FIGURE 7.2: View south along Route 130 near Bridgeboro St in Delran Township. *(Source: Famartin, Wikimedia Commons, CC-BY-SA-4.0)*

References and Endnotes

1 Municipal Climate Resilience Planning Guide. Office of Planning Advocacy. Department of State, Business Action Center. May 2022. https://nj.gov/state/bac/planning/documents/resilience-plan-guide.pdf.

2 2020 New Jersey Scientific Report on Climate Change. New Jersey Department of Environmental Protection. June 30, 2020. https:dep.nj.gov/wp-content/uploads/climatechange/docs/nj-scientific-report-2020.pdf.

3 Ibid.

4 Burlington County Hazard Mitigation Plan 2019. Burlington County. Section 5.4.4-3. https://co.burlington.nj.us/DocumentCenter/View/11913/2019-Hazard-Mitigation-Plan--Final.

5 Burlington City, NJ Coastal Vulnerability Assessment Report. Delaware Valley Regional Planning Commission. New Jersey Resilient Coastal Communities Initiative. December 2017. Page 4. https://www.dvrpc.org/reports/17033.pdf.

6 Burlington County Hazard Mitigation Plan 2019. Burlington County. Sections 5.4.4-5; 5.4.4-6. https://co.burlington.nj.us/DocumentCenter/View/11913/2019-Hazard-Mitigation-Plan--Final.

7 Identifying Socially Vulnerable Populations. New Jersey Department of Environmental Protection .July 6, 2023. https://dep.nj.gov/climatechange/training/asat-unit3/#1-what-does-identifying-socially-vulnerable-populations-mean







RESILIENT NJ