# Town and Village of Ossining

## 2024 Climate Vulnerability Assessment and Adaptation Plan

Village of Ossining Downtown Area, taken from website

August 2024

Produced by the Town and Village of Ossining Climate Smart Communities Task Forces
with Assistance from the Hudson Valley Regional Council and
ICLEI – Local Governments for Sustainability USA

Adopted on **Date**

CAPI Adapt is a program of the Hudson Valley Regional Council. This document was prepared for the Hudson River Estuary Program, New York State Department of Environmental Conservation, with support from the New York State Environmental Protection Fund, in cooperation with NEIWPCC. The viewpoints expressed here do not necessarily represent those of NEIWPCC or NYS DEC, nor does mention of trade names, commercial products, or causes constitute endorsement or recommendation for use.

Date/Time last saved: 1/21/2025 9:52:00 AM 1/21/2025 9:52:00 AM

# Credits and Acknowledgments

This document was prepared by the core Climate Action Planning Institute ("CAPI Adapt") team from CAPI Adapt Town and Village of Ossining, comprised of the following individuals:

- Liz Feldman, Town of Ossining
- Martha Quituisaca, Town of Ossining
- Evan Rodriguez, Town of Ossining
- Paige Flanagan, Town of Ossining
- David Margulis, Town of Ossining
- Maddi Zachacz, Village of Ossining
- Kate Schlott, Village of Ossining
- Suzie Ross, Green Ossining
- Meliya Soyer, Climate Action Planning Institute Intern

Special thanks to Green Ossining, Mary Lambert-CAPI Coordinator at the Hudson Valley Regional Council, the residents of the Town and the Village of Ossining for their willingness to contribute to this process, and to the Ossining municipal leadership teams for supporting this program, for allocating staff resources to this process, and for adopting this plan.

The Hudson Valley Regional Council's (HVRC) Climate Action Planning Institute (CAPI) Adapt Program provided the Town and Village of Ossining with technical assistance in completing this climate vulnerability assessment. Additional thanks to ICLEI, the Hudson River Estuary Program, and the fourteen other CAPI Adapt municipalities - counties, towns, and villages in Dutchess and Westchester Counties, who provided insight, support, and feedback.

This Climate Vulnerability Assessment and Adaptation Plan was prepared using a template developed by HVRC, drawing on the work of New York State Local Climate Change Adaptation and Resilience Plan Template, and CVAs from other municipalities. CAPI Adapt is a program of the HVRC. This document was prepared for the Hudson River Estuary Program, New York State Department of Environmental Conservation, with support from the New York State Environmental Protection Fund, in cooperation with NEIWPCC. The viewpoints expressed here do not necessarily represent those of NEIWPCC or NYS DEC, nor does mention of trade names, commercial products, or causes constitute endorsement or recommendation for use.

# Table of Contents

# Executive Summary

A multitude of hazards result from climate change. Based on scientific data collected over decades, the largest threats to Westchester County stem from increasing temperatures, rising sea levels, and changing precipitation patterns.

These hazards cause social, environmental, and infrastructure damage and losses outlined in the initial part of this Climate Vulnerability Assessment and Adaptation Plan (CVAAP). The latter sections address recommended adaptation strategies to address these vulnerabilities. To avoid such damage today and into the future, the Town and Village of Ossining must work with partners, such as community-based organizations, regional planning organizations, states, and federal agencies, to increase their resiliency and adapt to these conditions. Devastating storms, such as Tropical Storm Isaias and Irene and Superstorm Sandy, have reinforced this need and led communities in Westchester County, such as Ossining, to climate action resiliency planning to protect residents and mitigate risk. Ultimately, leadership on climate resilience will reduce the exposure and vulnerability of citizens, infrastructure, and ecosystems, and will serve as a model for communities across New York State and the country.

The Climate Smart Communities (CSC) Program provides a framework for implementing climate-smart resiliency actions. Developing a climate vulnerability assessment and a climate adaptation plan are two of the priority actions in the Pledge Element (PE) 7 category. The CSC Program ensures that recommendations to promote community resiliency are based on climate science and relevant data and address the top hazards in a community. The framework mandates an inclusive process, with public outreach and engagement each step of the way. Members of the Town of Ossining and Village of Ossining CAPI Adapt Teams met with municipal officials and committees, engaged local community members at local events, leveraged the municipal web site and social media platforms to solicit input and feedback, and participated in CAPI Adapt cohort trainings and meetings, including a full day kick-off workshop hosted by the Hudson Valley Regional Council in partnership with ICLEI. The workshop introduced the cohort to the region's top climate hazards, followed by collaborative sessions where the team brainstormed Ossining's vulnerable assets and communities, and discussed potential strategies to prepare for these climate hazards.

Ossining's key findings highlight the impact of rising temperatures and heat waves on vulnerable populations, as well as the effects of sea level rise and flooding on local roads highways, dams, and low-lying buildings, train tracks, and electrical conductors. The assessment also considers the multitude of secondary effects from changing precipitation patterns, i.e., heavier downpours on trees and wires creating power outages, as well as on storm drains and undersized culverts or passages that become easily clogged and overwhelmed.

# Introduction

The Town and Village of Ossining are in Westchester County in the Mid-Hudson Region of New York. Although the geographic Town of Ossining includes the incorporated Villages of Ossining and much of Briarcliff Manor, the Town's municipal authority is limited to the unincorporated portion of the geographic Town ( called "The Town Outside" locally and will be the area referred to here as the "Town"). Geographic Ossining borders the Hudson River to the west (with approximately 4 miles of river shoreline), the Town of New Castle to the north and the Town of Mount Pleasant to the east and south. US Route 9 runs through the Village and Town, running from the George Washington Bridge (NYC) to just south of the Canadian border. MetroNorth runs along the riverfront through Ossining and provides commuter access and express service to NYC, and north to the City of Beacon. The tracks are owned by Amtrack. New York State Routes 133 and 134 also run East to West through Ossining.

Although the Town as a whole boasts a population near 40,000, the population is largely concentrated within the 3.2 square miles of the Village of Ossining (26,542 in the 2023 US Census estimate). As a result, Village government is significantly larger (and consequently, provides more services and employs more staff) than the Town; the Town contracts for Police, Fire, Finance, IT, Recreation, and Engineering services from the Village, and also leases space in most Village-owned buildings. (For purposes of this Plan, the Town owns three buildings—the Cedar Lane Art Center, Town Highway Office/ Garage facility, and the Ryder Park Garage). Both municipalities are governed by an elected board of five: in the Town, the elected Supervisor oversees daily operations, whereas in the Village daily operations are tasked to an appointed Village Manager.

Among the exceptional services offered by the Ossining municipalities are the community's unique recreational assets. The Hudson River is unquestionably a major element of this, and figures prominently not just in Ossining's history but in the daily life of its residents. Louis Engel Park and Henry Gourdine Park offer riverfront open space, concerts and events, while the Sing Sing Kill Greenway traces the Kill Brook through the Village in a breathtaking vista that also serves as a direct path to the waterfront. The Town and Village both boast acres of parkland, all of which are spaces residents can use for walking, gathering, and spending time outdoors. Residents can also take advantage of the Joseph G. Caputo Community Center, which provides affordable (or free) programming to residents of all ages, as well as an Olympic-sized pool and newly-renovated locker rooms, and also serves as home for the Village's newly-formed Youth Bureau and the federally-funded Senior Nutrition Program staffed by the Town of Ossining.

Both communities also benefit from the Ossining Union Free School District, which educates nearly 5000 students from all corners of the District's boundaries, which includes the Village and Unincorporated Town, as well as sections of New Castle, Briarcliff and Yorktown. Governed by an independently-elected school board, the School District also extends to include the Ossining Public Library, centrally located in the heart of the Village. Originally a Carnegie Library, the newest iteration of the building is powered by geothermal energy, and is regularly featured as a "Best in Westchester" for children's programming. Other municipal entities own large parcels throughout Ossining—Westchester County owns and operates a wastewater treatment facility adjacent to Town-owned Engel Waterfront Park, and New York State Department of Corrections' Sing Sing Correctional Facility occupies much of the waterfront along the southern end of the Village.

Though the Village and Town have much in common, there is some disparity in the demographics. Five of seven census tracts in the Village of Ossining have been designated as DACs (Disadvantaged Communities) by the Climate Justice Working Group (CJWG) under NYS' Climate Act, with one downtown/waterfront tract (133.01, representing more than 3300 residents) experiencing an Environmental Burden higher than 96% of census tracts statewide, with a Population Vulnerability higher than 79% of census tracts in NYS. The Unincorporated Town is covered by one census tract (137), which is not considered a DAC (nor is the Town's census tract covering Briarcliff Manor). he 2023 median household income in the Village of Ossining was $99,678. -- this is above the median household income for NYS but below that of Westchester County ($114,651 in 2023). About 7% of the Village population live below the poverty line. Almost half of all Village residents speak a language other than English at home (47.2%) and over one third of all households in the Village speak Spanish at home[1]. In 2023, about 11% of Village residents under the age of 65 did not have health care coverage. I 15.6% of the Village's population is aged 65 or older, which is slightly lower than the NYS average (18.6%), and 33.1% of the Village's population is foreign-born (higher than the NYS average of 23.1%).

Statistics for the Town Outside are sparse as the US Census surveys the geographic Town rather than the municipal unit. In general, residents of the unincorporated Town have slightly higher average incomes, have higher residential property values, and have a higher proportion of native English speakers than residents of the Village.

[1] US Census Bureau, https://data.census.gov/profile/Ossining_village,_New_York?g=160XX00US3655530

**Background of the Town and Village of Ossining's climate planning accomplishments.**

Residents of the Town and Village of Ossining have long advocated for sustainability in planning, and daily operations, and local representatives from both communities have a long history of working in concert to achieve climate action goals. The modern history of this began in 2010 with the formation of Green Ossining, a Village/Town committee seeking to promote environmental sustainability and to develop practical methods to protect local natural resources. In recent years, the Town and Village, in coordination with Green Ossining, have worked in close partnership with Sustainable Westchester to embark on exciting public campaigns to encourage energy efficiency upgrades, rooftop solar, air source heat pumps, and geothermal installations for property owners, and on the Grid Rewards Program to encourage reduced electric consumption during peak demand periods. The Village and Town are also early adopters of CCA (Community Choice Aggregation) through Westchester Power, and of LED streetlight technology, completing a total replacement project in 2015. Ossining also has one of the first Community Solar projects in the area led by the Maryknoll Fathers and Brothers. further, the communities were chosen as a site for the Cornell Climate-adaptive Design Process Studio in Fall of 2019, and also pursued "Phase Two" of the process, working with HCR to design the Ossining Shoreline Revitalization Project which contemplates climate-adaptive interventions for municipally-owned property at Gourdine and Engel Parks.

The Town, Village and Green Ossining have also worked closely with 511NYRideshare and local businesses to develop programming to help promote international Car Free Day (annually on September 22nd) in an effort to reduce transportation emissions. The award-winning multi-faceted program ran for over five years and included promoting public transit options and carpooling, use of bicycles and e-bikes, refraining from single-occupancy internal combustion engine vehicle use, opting for working remotely, and a variety of other ways that could positively impact transportation emissions

The Town has already taken many steps to promote resiliency and improve quality of life for its residents, while preparing for future climate hazards. Some examples include the creation of a drop-off food scraps program that was launched in 2019 and now has been updated to include a subscription-based home pick up service. An updated tree inventory is slated for 2025 and tree planting policy has been updated to take the changing climate into consideration. An air source heat pump has been installed and solar panels are in process at the Cedar Lane Art Center, with2020 Census material. PV lighting installed at the Cedar Lane dog park. Two hybrid and two electric vehicles are in use by the municipality and another is coming soon.

The Town of Ossining was designated as a Climate Smart Community by New York State in 2020-- the CSC Program encourages local communities to act to mitigate greenhouse gas emissions and adapt to climate change. The Town currently holds a Bronze-level certification,

with projects and actions planned to gain the Silver-level certification in the near future. Also a NYSERDA Clean Energy Community (with 14 actions completed), the Town of Ossining is also currently creating a climate smart resiliency gap analysis to better understand gaps in planning and better prepare for the future.

The Village has also taken steps to become more resilient to climate change, reduce greenhouse gas emissions, and become a more sustainable community. With 7 actions completed under NYSERDA's Clean Energy Community program, the Village is working towards gaining a Bronze-level Climate Smart Community certification. They are working on several resiliency projects, including the conversion of municipal fleet vehicles to electric and hybrid vehicles, the recent reconstruction of the dam at Indian Brook, to make it more resilient to flooding.

As the Indian Brook Water Treatment Plant provides drinking water to properties in the Village and Town, the communities have worked together to begin construction on a new IBWTP, which broke ground in 2024. When completed, the Plant will incorporate state-of-the-art filtration, as well as added capacity, to treat sourced water from the Indian Brook Reservoir, as well as water purchased from New York City. The new IBWTP will also include technology to eliminate potential taste and odor concerns caused by harmful algae blooms, and will allow the treatment process to easily be modified to protect against emerging contaminants and water quality challenges.

The Town of Ossining and Village of Ossining chose to come together to work on this CVAAP to gain a deeper understanding of the shared social, infrastructure and ecosystem-level vulnerabilities impacting residents of both municipalities. Also, by working together, the Town and Village can more effectively offer support services to residents in times of crises. Both municipalities are relatively small, and so they can pool resources to support residents facing climate related disasters. Green Ossining, a joint initiative addressing environmental challenges in both communities, exemplifies their collaborative efforts, making it a natural step to extend this partnership to the CVA.

Documents from the Town and Village of Ossining were used to inform this CVA. The Town and Village both completed Government Operations Climate Action Plans in 2024, Comprehensive Plans in 2021 and 2022 respectively, and Hazard Mitigation Plans with the County in 2021. The Town's Comprehensive Plan, adopted in 2022, included sustainability elements submitted to Climate Smart Communities to earn points to their Bronze-level certification.

### What is a CVAAP and why complete one?

A CVAaP identifies community assets, systems, and populations that are susceptible to climate change. A vulnerability assessment is a necessary step in developing a climate adaptation

strategy because it identifies and characterizes the environmental, infrastructural, and social elements of a community that need adaptive measures. Drafting a CVAAP includes the following steps:

- Identify climatic hazards occurring and likely to occur within the geographic boundary of interest.
- Identify community assets, systems, and populations currently and likely to be exposed to the identified climatic hazards.
- Assess the sensitivity and adaptive capacity of each exposed asset, system, and population to each applicable hazard.
- Use a prioritization methodology to rank each identified community facet to inform adaptation strategies.
- Define and initiate a public engagement strategy, starting with the co-creation of a community climate adaptation and resilience vision.
- Develop and prioritize strategies to adapt to changing conditions and achieve the community's resilience vision.
- Seek feedback and input into the prioritized strategies and the vision from key stakeholders, including frontline communities, as well as the general public.

A CVAap increases local awareness and literacy of climate vulnerability and resilience and encourages a community to take ownership and support implementation of actions.

# Vulnerability Assessment Background and Considerations

**Methodology**

Anticipated shifts in climate and environmental conditions, such as changes in storm intensity, heat waves, and sea level rise, are expected to impact interactions with natural resources, infrastructure and social assets. Many resources are available to aid in understanding and assessing the potential impacts of different climate change scenarios on communities in our region. This assessment process incorporated a variety of tools and data sources, selected based on their practicality, comprehensiveness, and potential for future updates. Those include:

- New York State's 2024 Climate Impacts Assessment
- NYSERDA's ClimAID Report
- NOAA National Centers for Environmental Information, 2023 Global Climate Report
- Scenic Hudson's Sea Level Rise Mapper
- The US Fifth National Climate Assessment

These tools, along with others used in this report, highlight numerous potential future scenarios. A complete list of tools used is included in the reference section. Given the complexity of both global and local factors influencing these outcomes, predicting specific scenarios is challenging. Therefore, it is crucial to prepare for a range of possibilities. Despite this uncertainty, general trends and approximate estimates can guide adaptation planning efforts.

The methodology's context and components are elaborated upon in subsequent sections. The approach taken in this vulnerability assessment aligns with the criteria of the New York State Climate Smart Communities program and ICLEI's GreenClimateCities framework.

**Process**

Both the Town and the Village made comprehensive and meaningful public engagement efforts for previous plans and developments used to inform this CVAAP. The 2021 Village Comprehensive Plan process included many opportunities for resident and community outreach, engagement, and feedback; the Village used multiple formats of outreach to ensure they reached different groups of people throughout the process, which relied on webinars, virtual open houses, and even socially-distant in-person meetings in the later days of the COVID-19 pandemic. The Village gathered residents for feedback who were involved in different development sectors, such as housing, economic development, community services, waterfront and environmental organizations, infrastructure and municipal services, and cultural and historic organizations. They also used virtual maps, virtual idea walls, and surveys

to reach a larger segment of residents than in-person meetings could, particularly in a working-class community. These efforts helped connect residents and municipal officials to share ideas and priorities.

The Town also created many opportunities for community and stakeholder engagement while creating their recent comprehensive plan, including interactive posters downtown, community forums, surveys, and workshops. The Town hopes to continue the engagement momentum already started in this CVA process to best reflect the goals of community members.

The joint Town and Village Shoreline Revitalization Project also relied heavily on public engagement. The municipalities used surveys, held community meetings, and tabled at Green Ossining's Earth Day celebration to collect public comments from residents, and hosted a webpage which explained the scope of the project and future potential shoreline initiatives in both English and Spanish.

Working from this playbook, the Ossining CAPI Adapt team ("the Team"), engaging various communities worked to identify the assets most vulnerableto climate change in five phases:

- **Phase 1: Planning Workshop.** The core Town of Ossining and Village of Ossining CAPI Adapt Team participated in a CAPI Adapt Program workshop on February 8th, 2024. This workshop was attended by Catherine Alberte (Village Environmental Advisory Committee member), Paige Flanagan (Confidential Secretary to the Town Supervisor), and David Margulis (Town Environmental Advisory Committee member). In that workshop, the Team engaged in three exercises on equity brainstorming, assessing community assets and vulnerabilities, and adaptation ranking strategies. The Team was asked to identify infrastructural, environmental, and social assets in the community, determine which assets are most susceptible to the identified climate hazards, and to prioritize potential actions to safeguard these assets. The CAPI Adapt workshop yielded assets, which were then organized into distinct categories or areas of concern and prioritized. The output of this work was shared with the Ossining Climate Smart Communities Task Forces.

- **Phase 2: Municipal Input.** On April 29 an in-person meeting was held with the Town Supervisor and members of the police, fire department and municipal staff responsible for emergency management services. They were shown the initial findings and asked to identify infrastructure, environmental, and social assets in the community, determine which assets are most susceptible to the identified climate hazards, and to prioritize potential actions to safeguard these assets.

- **Phase 3: Community-wide Outreach.** Also in April 2024, a Climate Vulnerability Assessment survey was made available online to all residents of **The Town and Village of Ossining** and all municipal staff. The survey was designed to take approximately 10 minutes to complete. The survey announcement was available on the municipal web site and a link was emailed to all residents. Residents had 4 weeks to complete the survey. Over 10% responded to the survey.

- **Phase 4: Focused Resident Outreach and Engagement**. In May 2024, the Team met with the Youth Council and the Senior Council to seek input from more vulnerable residents. The Team also tabled at Ossining Farmers Markets in April and May, where they distributed fact sheets on the CAPI program and flyers on preliminary findings. The fact sheet and the flyer both provided a QR code to allow residents to participate. The Team met with the Climate Advisory Council and the Climate Smart Communities Task Force to gather further input + feedback on March 1.

- **Phase 5: Municipal Council.** The Town and Village of Ossining CAPI Adapt team members presented a draft CVA to the Town and Village of Ossining for review in December 2024. In each phase, the Town and Village of Ossining CAPI Adapt Team provided project updates on the municipal web site. (*Pending))

# Summary of Findings: Hazards

The Hudson River Estuary Program prepared the summary of local climate hazards in this chapter as a part of the Climate Action Planning Institute (CAPI). The chapter identifies historic climate trends and introduces future projections to address the climate hazards most likely to affect Westchester County in the coming decades.

The data serves as a starting point for recognizing important climate hazards and risks in Westchester County but is limited to information available to the New York State Department of Environment Conservation (NYS DEC) and its partners at the time of this writing and is not a substitute for on-site survey and assessment. New York's changing climate presents new challenges and opportunities for communities in the State. It is vital for local decision-makers and community members to understand their community's vulnerability to a changing climate and take steps to increase their climate resilience.

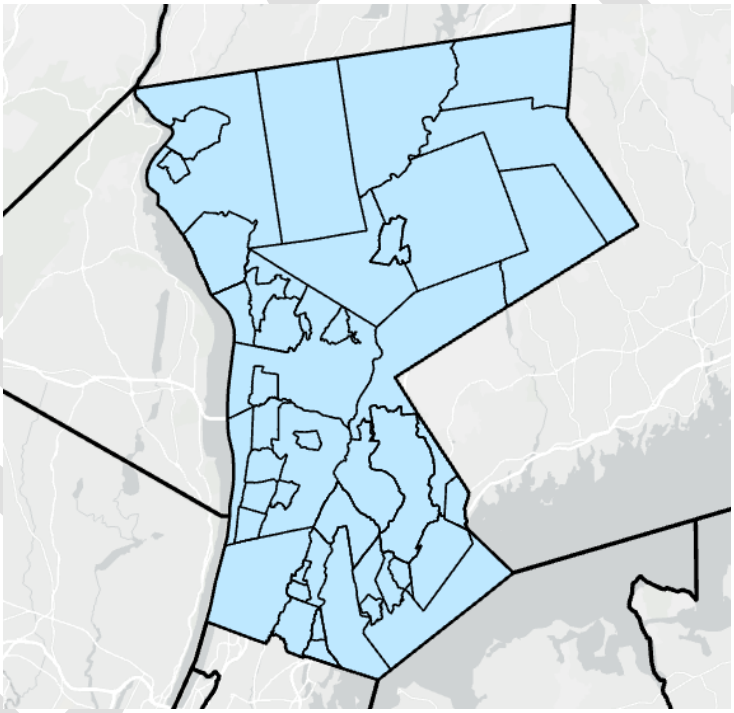


**Figure *1***: Map of Westchester County

Using the Governors' 2100 Commission report and the NYS Climate Impacts assessments, this document presents the Westchester County primary climate hazards and the risks and opportunities they present. A lot can change in a century, so it is never too early to start.

Three significant climate hazards (trends) are expected to affect New York State residents during the 21st century: increasing temperatures, rising sea level, and changing precipitation patterns. These trends are leading to three primary climate risks (human impacts): heat waves,

flooding, and drought. Communities can plan and implement resilience strategies to reduce their vulnerability and thrive under changing conditions.

## Increasing Temperatures

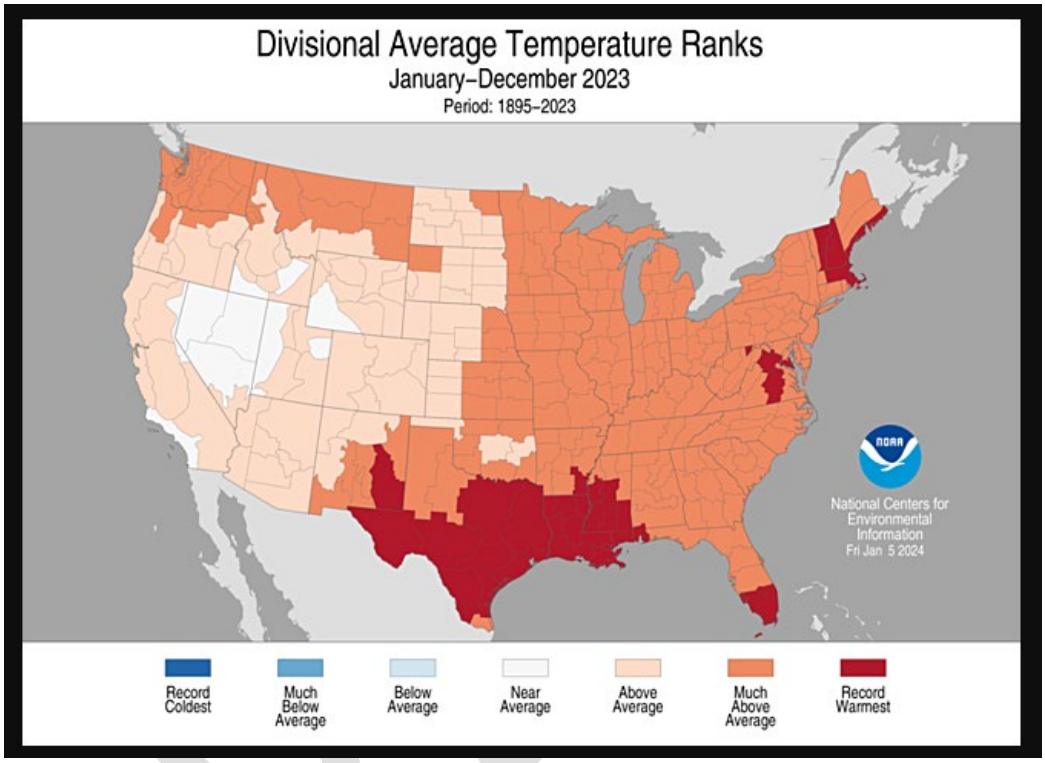



**Figure 2**: Divisional Average Temperature Ranks. Source: National Centers for Environmental Information

Annual average temperatures have been steadily increasing in New York State, posing new challenges to human health, electricity demand, and many of our industries, including tourism, recreation, and agriculture. Since 1970, temperature increases in New York have surpassed national and global averages:

- 2023 Global annual average temperature up **2.12°F** above 20th century average.[1]
- 2023 U.S. annual average temperature up **2.4°F** above 20th century average.[2]
- 2023 NY annual average temperature up **2.2°F** above the average from 1991 - 2020.[2]

The average annual temperature around Westchester County is expected to increase approximately four to six degrees by mid- century and as much as 11 degrees by 2100.[2] As a reference point, by the 2080s, New York City's average temperature is projected to be on par with the 20th century average for Birmingham, Alabama.[3]

| | Baseline 1981 -2010 | 2030s | 2050s | 2080s | 2100 |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Annual average air temperature** | 50.8° F | 52.8 – 55.7°F | 54 – 58°F | 55.6 – 62.7°F | 56° – 64.7°F |
| **Increase in annual average** | | 2.0 – 4.9°F | 3.2 – 7.2°F | 4.8 – 11.9 | 5.2 – 13.9°F |

**Table 1.** Like all projections, these climate projections have uncertainty embedded within them. Sources of uncertainty include data and modeling constraints, the random nature of some parts of the climate system, and limited understanding of some physical processes. Levels of uncertainty are characterized using state-of-the-art climate models, multiple scenarios of future greenhouse gas concentrations, and recent peer-reviewed literature. Even so, the projections are not true probabilities, so the specific numbers should not be emphasized, and the potential for error should be acknowledged. Source: Climate Impacts Assessment.[3]

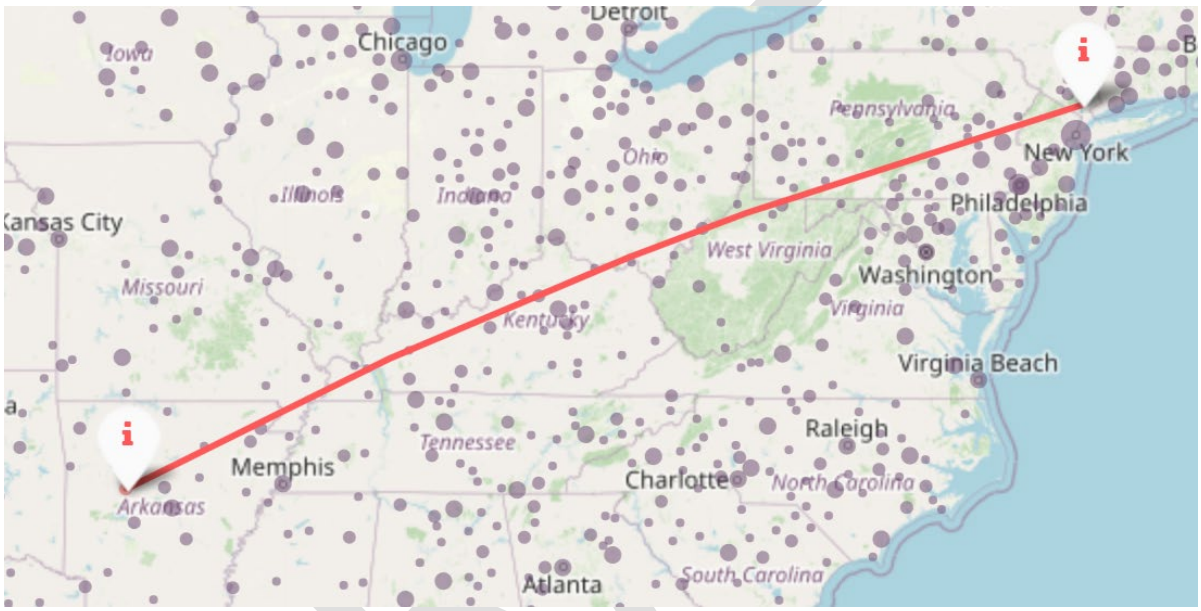



**Figure 3**: Average Temperature change in 2080 for Ossining, NY and its best climate analog. Source: University of Maryland Center for Environmental Science[7].

According to the Maryland Center for Environmental Science Climate Change Mapper, the Town of Ossining's projected annual temperature in 2080 will be most like that of Ola, Arkansas. This considers high emissions levels and should drive the Town and other places to be more conscious of their GHG emissions. The projected summer temperature will be 12.1 degrees Fahrenheit warmer than current averages and will also be 5.3% wetter. The winter temperatures will be 8.9 degrees Fahrenheit warmer than current averages and will also be 18.3% wetter.

An analysis of historical trends in annual average temperature and precipitation was conducted for 27 weather stations across New York State. Below are the results from the Southern Hudson River Valley's Dobbs Ferry weather station in New York State taken from the latest New York State Climate Change Projections.[3]

| **Trend in Annual Average Temperature form 1901-2020 from observed weather stations** |
|---|
| ❖Temperature increase for Southern Hudson River Valley - Dobbs Ferry: **0.34 °F/decade** |

| Trend in Average Annual Precipitation from 1901–2020 for Observed Weather Stations in New York State |
|---|
| ❖Precipitation increase for Southern Hudson River Valley – Dobbs Ferry: **0.39 inches/decade** |

**Table 2**. Trend is significant at the 99% significance level. Source: Weather Station Data: Dobbs Ferry, NY

### Projected Temperature Changes for Dobbs Ferry, New York

| | Baseline 1981-2010 | 2030s | 2050s | 2080s |
|---|---|---|---|---|
| # Days per year above 90°F | 18 | 29 – 57 | 34 – 73 | 48 – 108 |
| # Days per year above 95°F | 4 | 7 – 29 | 9 – 38 | 18 – 76 |
| # Heat waves per year | 2 | 4 – 8 | 5 – 9 | 6 – 10 |
| Average # days of each heat wave | 4 | 5 – 6 | 5 – 6 | 5 – 10 |
| Maximum heat Index | 100 | 106 - 114 | 108 - 120 | 112 - 136 |
| # Days per year ≤ 32°F | 106 | 67 – 90 | 37 – 82 | 8 – 74 |

**Table 3**. Projections are based on 16 GCMs (14 for heat index) and 2 SSPs and are relative to the 1981– 2010 base period. Baseline data are for the 1981–2010 base period and are from the NOAA National Centers for Environmental Information (NCEI). Decimal places are shown for values less than 1, although this does not indicate higher precision or certainty. Heat index was computed using the formula from the National Weather Service. Source: Stevens, A., & Lamie, C., Eds. (2024). New York State Climate Impacts Assessment: Understanding and preparing for our changing climate. *https://nysclimateimpacts.org*

## Rising Sea Level

Global sea level is rising due to various factors, including thermal expansion from warmer water temperatures, and melting of land-based ice. The Hudson River is connected to and influenced by the sea; therefore, it experiences tides and contains saltwater in its lower reaches. This is why the river south of the federal dam at Troy is considered an estuary. It is also the reason why the Hudson River's water level is rising with global sea level.

**Since 1900, sea level in the lower Hudson has risen over 13 inches.**[4] Below are Albany sea level rise projections taken from the 2023 Climate Impacts Assessment for New York State which are based on the results from the IPCC 6th Assessment report and show the range from the low-estimate (10th percentiles) to the high-estimate (90th percentile). The table showing the projections of the sea-level rise with rapid ice melt were taken from NYS 2100 Commission Report. The rapid-ice melt scenario is based on acceleration of recent rates of ice melt in the Greenland and West Antarctic Ice sheets and paleoclimate studies. These projections are consistent with the most recent projections released by New York State in the Governor's 2100 Commission report (http://goo.gl/K9ohoi).[5]

| | Baseline 1981 -2010 | 2030s | 2050s | 2080s | 2100 |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **New York City (The Battery) Sea Level Rise - Inches** | | 6” – 13” | 12” – 23” | 21” – 45” | 25” – 65” |

**Table 4**. Like all projections, these climate projections have uncertainty embedded within them. Sources of uncertainty include data and modeling constraints, the random nature of some parts of the climate system, and limited understanding of some physical processes. Levels of uncertainty are characterized using state-of-the-art climate models, multiple scenarios of future greenhouse gas concentrations, and recent peer-reviewed literature. Even so, the projections are not true probabilities, so the specific numbers should not be emphasized, and the potential for error should be acknowledged. Source: NYS Climate Impacts Assessments.[3]

| | | **2020s** | **2050s** | **2080s** | **2100** |
|---|---|---|---|---|---|
| **Sea- Level Rise with Rapid Ice Melt** | No baseline | 4”-9” | 17”- 26” | 37”- 50” | 52” – 68” |

**Table 5**. Values are the central range (middle 67%) of model-based probabilities rounded to the nearest inch. The rapid-ice melt scenario is based on acceleration of recent rates of ice melt in the Greenland and West Antarctic Ice sheets and paleoclimate studies. These projections are consistent with the most recent projections released by New York State in the Governor's 2100 Commission report. Source: NYS 2100 Commission Report.[5]

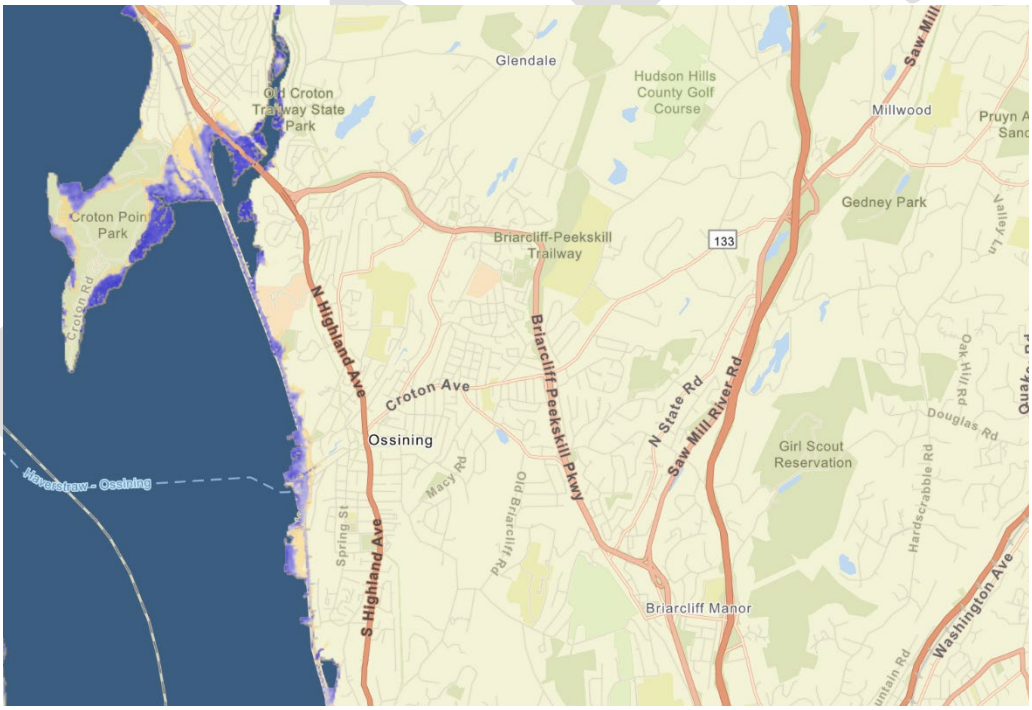



**Figure 4**: Map of Sea level rise projections for the Town and Village of Ossining for 2080[6]

## Changing precipitation patterns

Precipitation has become more variable and extreme, whereas total rainfall has changed only marginally. **The total annual precipitation in New York State from 1901 – 2022 has increased by 10% to 20%.** Overall, while New York is projected to remain a “water-rich” state, water

quality can be affected by the increase in total precipitation.[3]

The below table depicts the projections for average precipitation (mean precipitation) for the South Hudson River Valley, in which Westchester County is located. These projections were taken from the NYS Climate Impacts Assessment and are based on the global climate model (GCM) simulations from the latest version of the world climate research program's Coupled Model Intercomparison Project [3]

| | Baseline 1981-2010 | 2030s | 2050s | 2080s | 2100 |
|---|---|---|---|---|---|
| **Mean Precipitation** | 45.8 in. | 45.8" – 50.4" | 46.3" – 51.8" | 46.7" – 55.9" | 44.9" – 58.6" |
| **% Increase in precipitation** | | 0 – 10% | 1-13% | 2 – 22% | 2 – 28% |

**Table 6**. Like all projections, these climate projections have uncertainty embedded within them. Sources of uncertainty include data and modeling constraints, the random nature of some parts of the climate system, and limited understanding of some physical processes. Levels of uncertainty are characterized using state-of-the-art climate models, multiple scenarios of future greenhouse gas concentrations, and recent peer-reviewed literature. Even so, the projections are not true probabilities, so the specific numbers should not be emphasized, and the potential for error should be acknowledged. Source: NYS Climate Impacts Assessments.[3]

### Projected Changes in Extreme Events for Dobbs Ferry, New York

| | Baseline 1981-2010 | 2030s | 2050s | 2080s |
|---|---|---|---|---|
| # Days with precipitation > 1" | 15 | 15 – 19 | 15 – 18 | 15 – 19 |
| # Days with precipitation > 2" | 3 | 4 – 5 | 4 – 5 | 4 – 6 |
| # Days with precipitation > 4" | 0.2 | 0.2 | 0.2 | 0.2 – 0.6 |

**Table 7**. Projections are based on 16 GCMs (14 for heat index) and 2 SSPs and are relative to the 1981– 2010 base period. Baseline data are for the 1981–2010 base period and are from the NOAA National Centers for Environmental Information (NCEI). Decimal places are shown for values less than 1, although this does not indicate higher precision or certainty. Heat index was computed using the formula from the National Weather Service. Source: Stevens, A., & Lamie, C., Eds. (2024). New York State Climate Impacts Assessment: Understanding and preparing for our changing climate. *https://nysclimateimpacts.org*

# Summary of Findings: Key Assets and Vulnerabilities

**Infrastructure Assets**

Flooding of residential properties is a major concern of residents and of the Town. The Town has seen several repetitive flood events which could be devastating for residents to recover from. Flooding disproportionately impacts low-income groups. As climate change increases, flooding events will occur more frequently and cause more severe outcomes. The Town has identified flood risk areas and will monitor these regions during future storms. Additionally, they are conducting drainage studies, starting with the most problematic flooding areas ,and working to increase flow capacity and resiliency in these areas. The goal is to systematically improve stormwater system capabilities and capacity throughout the Town. Strategies are anticipated to include some replaced or enhanced infrastructure, retention areas and native plantings.

Route 134/9A is in a flood zone and is frequently impacted by flood events. This impacts everyone in the community, but especially individuals who need access to the road to pick up medications, food, or clean water are particularly impacted by this flood risk. The New York State Department of Transportation controls this section of the road which requires that they provide and implemnt the fixes. With wncouragement from Ossining the State recently addressed the first of the problems by upsizing the culvert under NYS Route 9a. There are still several more areas of work to complete the mitigation of the effects of flooding on the community.

The Town has expressed concerns about the Town Highway Department headquarters trailer. This structure is at an elevated risk of wind and storm damage. The department provides emergency assistance to residents, but if headquarters is put out of action, the assistance would be severely limited. Various esolutions of this issue are under study, including reinforcement or replacement of the trailer and relocation of the headquarters. The department assists all residents with any kind of natural disaster such as those that are of high concern with changing climates and sea level rise. This department helps mitigate disparities in disaster preparedness and disaster effects on residents, which will help vulnerable populations.

The Town and Village of Ossining share a drinking water facility, the Indian Brook Water Treatment Plant, and the adjacent Indian Brook Reservoir, located within the Crotonville section of the Unincorporated Town. As this critical infrastructure is exposed to both 1% and .2% storm events, the Village recently undertook a dam replacement project to safeguard the reservoir and the Plant from storm surges and flooding.

The Town has recognized that its stormwater piping system is not always providing the necessary flow rates given the increasing intensity of storms. The Town is doing a systemwide evaluation of its drainage corridors many of which have been impacted by these recent severe storms. Resolutions of the issue include the upsizing of piping and replacing corrugated piping with smoothbore pipe.

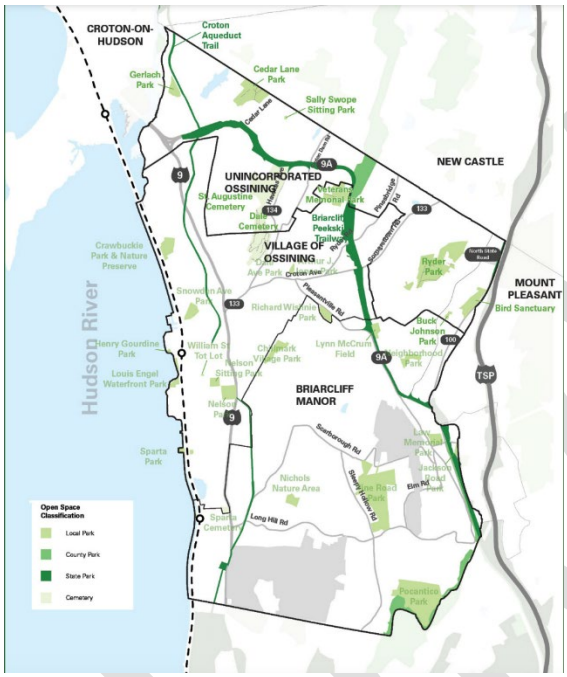
One of the main themes of the Town's 2022 Town Comprehensive Plan was increasing transportation options and connectivity for residents. It is also evident from 2020 census data that residents tend to drive to work rather than take public transportation. Fortunately, the community is starting to make in-roads to address this. In 2022, the Village of Ossining (in partnership with EIT INNO Energy and Nelson\Nygaard Consulting) was awarded a NYS Clean Transportation Prize under the Electric Mobility program to introduce Project MOVER, a multi-faceted $7M e-bike program targeted at lower-income families. The first component (bike share) debuted in the Village in Summer 2024, and will soon be replicated in not only the Town of Ossining, but (4) other "incubator" communities (Sleepy Hollow, Croton, Tarrytown and Dobbs Ferry), with hopes that the program (as well as the lease-to-own and bike library components) can scale up to the greater region in coming iterations. Not only is Project MOVER expected to reduce greenhouse gas emissions, it also aims to enable working class families to choose a less expensive transportation option for commuting to work, school, places of worship and recreation, while getting exercise and increasing access to outdoor assets that may be out of reach by foot. This may potentially dovetail with Millwood Ossining GO! (MOGO), a Town/Village initiative to create an east/west bike route connecting New Castle (Route 100/ Empire State Trailway), up NYS Route 133, and into Downtown Ossining/ the Hudson waterfront. The Town and Village will also be continuing to support the local bus networks which are so important for many residents, especially those without cars, as well as pursuing funding for an electric shuttle loop covering the two municipalities and the Ossining Train Station.

Both the Town and Village Comprehensive Plans lay out several ways to increase walkability and pedestrian safety.. Currently, the Town has recognized a lack of sidewalks, which makes travel much more dangerous for pedestrians. There are also very few sidewalks in the unincorporated Town that are ADA-compliant, which makes certain areas of Ossining very difficult to navigate, particularly for residents with mobility concerns or who are traveling with small children and strollers. The Town and Village also lack many crosswalks, which create risks for pedestrian accidents throughout Ossining. The Village has amplified their crosswalk program with innovative lighted beacons, reflective paint and increased enforcement. Further, with the help of CDBG grant funds, the Village continues to make improvements to neighborhoods with a high volume of residential foot traffic, particularly those near the bus depot, IFCA housing (locally-managed affordable units), houses of worship, the police station, and other government services—after the most recent cycle, the Village will have improved sidewalks and ADA-compliant curbs along the entirety of Spring Street, James Street, Ellis

Place, William Street, and Broad Avenue (aided by a Multi-Modal grant from NYS).

In addition, the Village's Route 9 Road Diet project will not only improve quality of life for local residents, but will also reverse the damaging consequences of Urban Renewal in Ossining's downtown. A project 20+ years in the making, a one-mile span of Route 9 (locally North/ South Highland Avenue) will be reduced to one lane each direction with a center lane, increasing pedestrian and driver safety by slowing down traffic and adding smart signaling. In the spirit of Complete Streets, pedestrian islands and streetscaping measures will also be employed along Route 9, complimenting the nearby newly-configured Historic Five Corners Intersection at the corners of Main, Spring, Brandreth and Central.

**Environmental Assets**



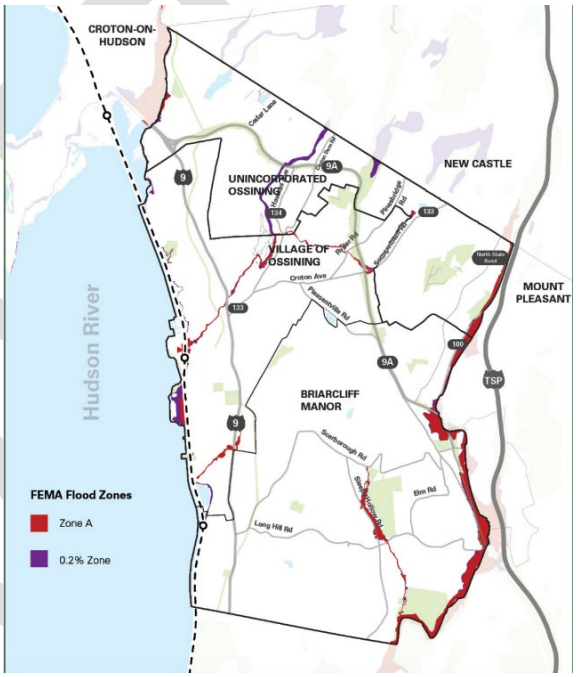




Figure 5: Map of open space and parks in the Ossining area, from the Westchester County GIS Open Space Dataset and published in the 2020 Town Comprehensive Plan.
Figure 6: Map of Flood Zones in Ossining, from the Westchester County GIS Floodplains Dataset and published in the 2020 Town Comprehensive Plan.

The Town and Village of Ossining are along the Hudson River, which allows the community to benefit from open spaces and resources but also presents extra risk of flood risk, which will continue to grow as sea levels rise. The Town is planning to revitalize the space they control along the waterfront to better protect the community against sea levels rising and increased flood severity and frequency. The Town of Ossining's Boat and Canoe Club is in danger of severe flooding along with other businesses in the area. In community surveys, residents agreed that the waterfront and shoreline are valuable resources to the community. The Town and Villagehave worked with the Cornell Climate Adaptive Studio to explore solutions for this issue. The Town has applied for a CDBG grant to increase the number of climate adaptive trees at the waterfront which would reduce the Urban Heat Island effect of the asphalt MTA

parking lots and provide shade for park visitors. Other landscaping, including native plantings, would be done in coordination with a landscape architect during the new stage design at Louis Engel Waterfront Park. Additionally, the Town is looking to add electrical outlets at this event location for food trucks and other vendors so that generators are not producing noise and exhaust during events.

Some of Ossining's natural assets include wetlands, lakes, ponds and shorelines. These natural resources serve as floodwater storage and offer essential ecosystem services to the community. The Town has determined that their shorelines are at risk of extreme damage from flooding, precipitation, and storm surge. Indian Brook runs through Ossining and currently is at risk of flooding several municipal buildings, most concerningly, the Indian Brook Water Treatment Plant. Additionally, the Pocantino River poses a significant risk of inland flooding to the community.

The parks around the municipalities are key in helping to improve air quality and maintain community health by providing spaces for residents to spend time outside. Additionally, the parks and open green space provide respite from potential heat island effects that will occur increasingly often with climate change. Future upgrades will also help ensure that parks are providing necessary ecosystem services to the community and ensure accessibility for residents and visitors. There is a lack of connectivity in the area that makes it harder to residents to use available parks and open spaces.

Fortunately, both the Village and Town (which are both Tree Cities through the Arbor Day Foundation) employ full-time Parks Department staff who have gotten rather familiar with the care and keeping of trees. Village Parks staff regularly attend ISA workshops/ training, and worked closely with the DEC's Regional Forester on a planting project in 2021, where 80+ native species trees were planted throughout Nelson Park and Nelson Sitting Park. The planting continues annually (albeit at a smaller scale) thanks to NYPA's Tree Power program, which offers high-quality discounted trees to municipal entities. The Town of Ossining, which has fewer but larger and more wooded municipal parks, has also secured several grants in support of vine removal, and has participated in the DEC's Trees for Tribs program. Though the damage caused by increasingly violent storms, the Emerald Ash Borer, the Hemlock Wooly Agelid and the Spotted Lanternfly continue to impact Ossining's trees, ongoing efforts to bolster the tree canopy and, in the Village particularly, increase the community's Tree Equity Score, are ongoing and aggressive.

Above-ground power lines are also sensitive to extreme weather events. Residents and government officials are concerned that trees may continue to fall on above ground power lines in heavy windstorms and cause fire hazards. This would create further problems for the town and for natural spaces. Con Edison controls local power operations and so future actions would require work with them to improve the infrastructure.

**Social Assets**

In terms of vulnerable populations, the Town, Village and their residents agreethat extreme heat and cold events particularly threaten elderly, young, and low-income community members who may not have the same access to heating or cooling. T hese communities are already at higher risk for climate change's health effects.  Additionally, these communities may also be affected by lack of communication and limited transportation, among other personalized hardships.  The municipalities recognizes the disparity of effects on individuals in these extreme weather events and will continue to work to ensure that the heating and cooling centers will have the resources available to help vulnerable individuals.

There is currently little food production in The Town and Village of Ossining, making residents reliant on outside sources for food. This means residents are subject to price surges and food shortages, which particularly affect already vulnerable populations**.** Another way the Town and Village of Ossining are addressing food insecurity is through school breakfasts and lunches. The Ossining School District provides free breakfast and lunch for all students, ensuring that all students get enough healthy food in the middle of the day to learn. This program helps alleviate food insecurity for families and ensures that food insecurity is not affecting academic performance.

# Summary of Findings: Recommendations for Adaptation

**Community Vision Statements:**

***The Village of Ossining aims to transition toward clean, carbon-free technologies and infrastructure upgrades that improve the health, livability and resilience of Ossining and its residents whenever possible. Village leadership has demonstrated a steadfast commitment to implementing common-sense measures to mitigate and adapt to climate change at every level of operations.***

***The Town of Ossining is committed to reducing its environmental footprint and to increasing the community's capacity to withstand and adapt to climate change.***

These vision statements aim to reflect the aspirations and values of the community. They helped inform and inspire the development of the recommended strategies (or specific actions) listed below. This vision is backed by the four (4) E's of sustainability: economy, equity, environment and energy which create the ability for a community to meet its needs without compromising the ability of future generations to meet their own needs. These vision statements were developed separately but both in 2023 during the process of collecting public input for each municipality's government operations climate action plans. The Town and Village of Ossining's Comprehensive Plans and the Climate Action Plans share this same vision. For more on the steps taken in developing this vision, see the Process section below.

The adaptation strategies or recommended actions listed in the following sections aim to achieve the Town and Village of Ossining's visions. These strategies are broken out into three categories or sectors: infrastructure, environmental and social. In each sector, a detailed description is included for each strategy, information on the strategy's co-benefits, owner, strategy cost and timing estimates, and other information relevant to the proposed strategy. These recommended actions will help Ossining stay on track to achieve its climate planning goals.

Communities of color and low-income populations have historically been under-served by programs and investments and under-represented in decision making on climate policy. Lack of low-carbon, safe transportation options and inefficient housing are examples of disparities experienced by these communities that result in fewer benefits from climate action opportunities. Additionally, infrastructure like carbon-emitting factories that degrade air quality, waste management facilities, and landfills, are often pushed into underserved communities whose voices are not heard or considered in policy making. These communities aren't only more vulnerable to natural disasters, but also to human-made health hazards and

infrastructure that is framed as important to the community in some way. These inequities primarily result from ongoing institutional racial bias and historical discriminatory practices that have resulted in the inequitable distribution of resources and access to opportunities.

Climate change is likely to amplify the impacts of these existing inequities and frontline communities such as lower income, communities of color, unhoused, outdoor workers, the very young, and older residents will disproportionately bear the burdens of climate change impacts. In addition, the many economic and health benefits of carbon reduction investments are not shared equitably across the city, especially among people of color and low-income communities.

The Town and Village of Ossining believe strongly in addressing the needs of its disadvantaged communities. The Ossining Union Free School District has several programs that intend to uplift disadvantaged students and communities to ensure equal opportunities for success in school. The Town and Village of Ossining also have initiated the construction of affordable housing units to keep Ossining affordable for residents and people who work in the area. Additionally, the Senior Nutrition program serves 80 seniors a day and provides exercise and activities for many more. The Town uses both electric and hybrid vehicles for transportation and meal delivery under this program. The Town's Call A Cab program helps economically disadvantaged, as well as other, seniors to afford transportation, as do free monthly shopping trips to big box stores like Walmart and weekly ones to Shoprite and the like.

## Co-Benefits

The following Co-benefits were used in the adaptation section to outline the different ways each action will benefit the community. The goal of an adaptation action is to impact multiple issues associated with climate change for maximum community benefit.

**Table 4**: Co-Benefit Symbols

| Symbol | Co-Benefit |
|---|---|
|  | High potential to save money |
|  | High potential to enhance resource security |
|  | High potential to create jobs |
|  | High potential to improve public health |
|  | High potential to deliver benefits to frontline communities |
|  | Potential to reduce GHG emissions |

1. **Saving Money:** In addition to addressing climate change, measures taken to adapt to climate

change may have other important benefits, such as the potential for cost savings. Many of the measures in this plan pay for themselves by reducing direct or indirect costs, such as infrastructure damage from more frequent and intense extreme storms.

2. **Enhance Resource Security:** Extreme and prolonged heat waves can put considerable strain on the reliability of energy delivery in peak periods. A strategic side benefit of climate change adaptation activities may be enhanced energy security through reduction in total demand. Planting more trees, for example, will reduce the heat island effect, decreasing strain on the energy system, and leading to service disruptions during times when cooling is most needed.
3. **Creation of jobs:** The environmental services industry has become a leading sector in job growth. Climate adaptation measures can spur business and job growth during the design, manufacture, and installation of energy efficient technologies and other green sectors. This presents a particular opportunity to reinvest in the local economy and generate green jobs within the The Town and Village of Ossining.
4. **Improve Public Health:** Climate change adaptation activities may foster healthier communities and advance public health outcomes. Trees for example provide oxygen, shade and absorb air pollutants, and tree planting efforts can improve air quality.
5. **Delivering Benefits to Frontline Communities:** Social equity is a major concern for addressing climate change. Research shows that vulnerable populations such as the elderly or chronically ill, low-income families, and people of color are more at risk when it comes to experiencing impacts of climate change. These communities already experience institutional and systematic oppression that results in less access to resources, capital, and services. Climate change exacerbates these gaps. By targeting programs and making changes to services or infrastructure, such as modifying flood protection and heat emergency response programs, before extreme events happen, we can mitigate the most devastating impacts to already vulnerable populations.
6. **Reduce Greenhouse Gases:** Many of the actions identified here to adapt to climate change will also help mitigate GHG emissions. For example, building microgrids powered by solar or hydropower will not only increase resiliency but will help to lower ghg emissions reductions.

## Recommended Actions - Infrastructure

| **Strategy 1: Update Hazard Mitigation Plans** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Update Hazard Mitigation Plans | **Description**: In partnership with Westchester County the Town and Village will each create full updated Hazard Mitigation Plans as required under the new FEMA guidelines for these plans. Communities with an approved HMP are eligible for federal hazard mitigation funding through programs like the **Federal Emergency Management Agency (FEMA)** Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) program. Also, New York State law and FEMA require communities to have an HMP to access certain disaster recovery funds and to ensure compliance with the **Disaster Mitigation Act of 2000**.<br><br>**Potential Cost**: This project is a low-cost project. | | |
| Co-Benefits: | Mayor/Town Supervisor/Department Heads | Low | 2025-2026 |
| **Strategy 2: Energy Use Reduction Goals** | **Owner** | **Cost Estimate** | **Timeframe** |
| Energy Use Reduction Goals in Municipally- Owned Buildings | **Description**: Setting goals for reducing energy consumption will facilitate the achievement of these goals and the cost and emission savings that will result from them.<br><br>**Potential Cost**: The cost for this adaptation will be low. | | |
| Co-Benefits: | Mayor/Town Supervisor/Boards | Low | 2026-2030 |

| **Strategy 3: Install Solar Panels at Municipal Buildings & Facilities** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Install Solar Panels at Municipal Buildings & Facilities (16 Croton, Community Center, Operations Center, Police/ Court Facility, Cedar Lane Park Arts Center and dog Park) as practical | **Description**: As part of reducing the municipalities' energy footprint, solar panels will be installed at municipal buildings and facilities to minimize external energy use.<br><br>**Potential Cost**: This is a medium-cost project that will take place as funding becomes available. | | |
| Co-Benefits: | Town Supervisor/Mayor/Facilitiy Managers | Medium | 2025, 2027-2029 |
| **Strategy 4: Consider Legislation enabling Battery Energy Storage** | **Owner** | **Cost Estimate** | **Timeframe** |
| Consider Legislation enabling Battery Energy Storage for return back into grid | **Description**: In order to encourage the increased uasage of solar power, determine if permitting battery energy storage within the Village is appropriate and desireable<br><br>**Potential Cost**: This project is a low-cost project. | | |
| Co-Benefits: | Mayor/Village Board | Low | 2025 |

| **Strategy 5: Waterfront Climate Adaptation** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| identify cost-effective solutions identified by the Cornell Climate Adaptive Studio (CAD)/ Shoreline Revitalization Project | **Description**: The Ossining waterfront is vulnerable to the effects of sea level rise and to erosion and the other damages caused by the increasing severity of storms. The municipalities will determine which solutions to these problems identified by the Cornell Climate Adaptive Studio (CAD)/ Shoreline Revitalization Project are cost-effective and seek grant funding to offset their costs.<br><br>**Potential Cost**: The potential costs for this adaptation could be high depending on the remediations selected. | | |
| Co-Benefits: | Mayor/Town Supervisor/Municipal Boards | High | 2027-2028 |
| **Strategy 6 Implementation of Water Conservation Policy for Municipal Buildings** | **Owner** | **Cost Estimate** | **Timeframe** |
| Introduction of Water Conservation Policy, including use of Water Conservation Fixtures, for all Municipal Buildings | **Description**: In order to reduce water consumption by the municipal governments, a water conservation policy will be introduced in all municipal buildings. This will include the replacement of water fixtures with their water conserving equivalents and a poster campaign in all facilities using water.<br><br>**Potential Cost**: This is a low-cost project. | | |
| Co-Benefits: | Town Supervisor/Mayor/Municipal Board | Low | 2026-2027 |

## Recommended Actions – Environmental

| **Strategy 1: Convert Fully to Electric Lawn Care Equipment** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Continue Investment in Electric Lawn Care Equipment for Use in Municipal Parks, including further implementation of "Green Zones" | **Description**: Both the Town and the Village of Ossining have significant inventories of trimming, mowing and blowing equipment for parks and other landscaping maintenance. Continuing the conversion of this equipment to electric power as is cost effective and practical will significantly reduce the environmental and noise impact of both municipalities' infrastructure. Further implementation of green zones will ensure that the benefits gained by this also are enjoyed by historically neglected communities.<br><br>**Potential Cost**: This project will be a medium-cost project overall as electric-powered heavy duty landscape equipment is moderately expensive. Lawn equipment is more price competitive. | | |
| Co-benefits: | Town Supervisor/ Mayor/Municipal Boards/Green Ossining | High | 2025-2027 |
| **Strategy 2: Move to Electric Powered Vehicles** | **Owner** | **Cost Estimate** | **Timeframe** |
| Move to Electric Vehicles as Cost Effective and Funds become Available | **Description**: Both the Town and the Village of Ossining have fleets of vehicles, including heavy duty highway and parks vehicles. Converting this equipment to electric power as is cost effective and practical will significantly reduce the environmental and noise impact of both municipalities' fleets. Keeping the costs of conversion under control will be a challenge.<br><br>**Potential Cost**: This is a high-cost project as replacements for diesel-powered heavy duty vehicles are expensive. Some of this cost might be offset by grant funding from for example NYSERDA programs and/or the **DEC Municipal ZEV Rebate Program**. | | |

| | | | |
|---|---|---|---|
| Co-Benefits: | Town Supervisor/Mayor/ Municipal Boards/Highway and Parks Department Heads | High | 2025-2030 |
| **Strategy 3: Pollinator Pathways** | **Owner** | **Cost Estimate** | **Timeframe** |
| Continue to Establish and Promote Pollinator Pathways | **Description**: Creating pollinator pathways helps to improve the entire food chain as well as improving the environment for people. It enhances the plant community by encouraging the planting of native plants and thereby provides food for pollinators. By increasing both the plant and the pollinator populations, food sources for birds are enhanced allowing for an increase in bird populations. This provides food for animals further up the food chain and a more pleasing and healthier environment for humans. By using park lands and encouraging private landowners to increase pollinator plantings, significant gains can be made at minimal cost.<br><br>**Cost/Feasibility**: This will be a low cost project. | | |
| Co-benefits: | Mayor/Town Supervisor | Low | 2025-2030 |
| **Strategy 4: Update Tree Protection Legislation** | Owner | Cost Estimate | Timeframe |
| Update Tree Protection Legislation (Tree Replacement/ Tree Bank/ Native Species) | **Description**: As the positive effect of a healthy tree population in all communities becomes more obvious and pressing, the need to update the laws protecting trees becomes more urgent. This low cost effort will bring the Village code into better alignment with current and future needs.<br><br>**Potential Cost**: Project cost is low | | |
| Co-benefits: | Mayor/Village Trustees | Low | 2025-2026 |

| **Strategy 5: Green Purchasing Policy** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Create and Adopt a Green Purchasing Policy | **Description**: Formal development and adoption of a green purchasing policy by the two municipal governments will help to ensure that they minimize their environmental footprints while supporting the local economy as possible.<br><br>**Potential Cost**: This is a low-cost project. | | |
| Co-Benefits: | Town Supervisor/Mayor/ Municipal Boards | Low | 2027 |
| **Strategy 6: Conduct a Natural Resource Inventory** | **Owner** | **Cost Estimate** | **Timeframe** |
| Commission the Environmental Advisory Committee to Conduct a Natural Resource Inventory | **Description**: The creation of a formal Natural Resources Inventory encourages participation in identifying and prioritizing natural, cultural and historical resources important to the community, and provides information that will support careful land-use planning and improved resource protection measures. It also will provide the Village access to grants and higher ratings in the CSC program. As consultants are often required for this process, there will be a considerable cost to completing this task.<br><br>**Cost/Feasibility**: This will be a medium cost project. | | |
| Co-benefits: | Mayor | Medium | 2025-2026 |

| **Strategy 7: Parks Maintenance Plan** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Formalize a Parks Maintenance Plan | **Description**: A formalized parks maintenance plan will provide a guideline to securing the utility of the parks to all of the user communities in Ossining while ensuring their environmental enhancement to the municipalities.<br><br>**Potential Cost**: This project will be a low-cost project. | | |
| Co-benefits: | Town Supervisor/ Mayor/Parks Department Heads/Green Ossining | Low | 2027 |
| **Strategy 8: Waterfront Revitalization Plan** | **Owner** | **Cost Estimate** | **Timeframe** |
| Update Local Waterfront Revitalization Plan to Incorporate Grant Funding Secured from DOS | **Description**: The Village's Waterfront Revitalization Plan has received extensive public input in its formation. It has now received further funding from the NY Department of State and needs to be updated to reflect this gain.<br><br>**Potential Cost**: This is a low-cost project. | | |
| Co-Benefits: | Mayor/Village Trustees | Low | 2026-2027 |

## Recommended Actions - Social

| **Strategy 1: Kill Brook Stormwater Project** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Protect and Preserve Kill Brook with 30 Water Street Project (Wilder Balter Partners) | **Description**: The Village is funding an affordable housing project which is in the flood zone of the Kill brook. This project is so important for the village to ensure affordability of living in Ossining. The Village is working with developers and engineers to reroute floodwater upstream to mitigate brook water energy during flood events. This project will limit stormwater impacts on both this housing project and on buildings further downstream. Protecting the affordable housing project will save the Village money in the future and will benefit residents of this building.<br><br>**Potentail Cost/Feasibility**: This project is high cost but will have positive downstream impacts for the Village. | | |
| Co-Benefits:  | Mayor, Village Board | High | 2025-2027 |
| **Strategy 2: Preparedness Planning** | **Owner** | **Cost Estimate** | **Timeframe** |
| Promote Preparedness Planning on Municipal Web Sites with Dedicated Page/ Campaigns To Communicate Plans and Processes | **Description**: The goal is to promote emergency preparedness among the residents of Ossining by communicating both the municipalities' plans in various emergency scenarios and appropriate residents' plans for those scenarios, including evacuations. Information will be integrated with the Countywide plans and available information.<br><br>**Cost/Feasibility**: Low Cost | | |

| | | | |
|---|---|---|---|
| Co-Benefits: | Mayor/Town Supervisor | Low | 2025-2030 |
| **Strategy 3: Post-Event Damage Assessment Strategy** | **Owner** | **Cost Estimate** | **Timeframe** |
| Develop a Post-Event Damage Assessment Plan and Communication Strategy | **Description**: As the title suggests, this project will promote emergency response preparedness within the municipalities operations units. Having a plan will increase assessment efficiency while reducing assessment completion times. And facilitating communications within the government will improve response effectiveness while potentially preserving resident lives and property<br><br>**Cost/Feasibility**: This would likely be a low-cost project since few physical resources are needed. | | |
| Co-Benefits: | Mayor/Town Supervisor/Department Heads | Low | 2027-2028 |
| **Strategy 4: Review Communications Plan** | **Owner** | **Cost Estimate** | **Timeframe** |
| Review and Improve communications with residents | **Description**: Review the Village's communications with residents. Use social media and other communication channels to share event information in various formats and languages, ensuring wide accessibility. Encourage residents to sign up for alerts for events of interest and in case of emergency.<br><br>**Potential Cost/Feasibility**: This project is low cost | | |
| Co-Benefits: | Mayor | Low | 2025-2030 |

| **Strategy 5: Project MOVER** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Introduce (Town) and Expand (Village) Project MOVER (NYSERDA) | **Description**: Project Mover has proven to be a hit with the Village's residents and the Town is looking to take the lessons learned and make the powered bike rentals available to their residents also. Meanwhile the Village is looking to adjust the program and to expand access to it.<br><br>**Cost/Feasibility**: Medium Cost | | |
| Co-Benefits: | Mayor/Town Supervisor | Medium | 2025-2027 |
| **Strategy 6: Promote "Buy Local" Campaign** | **Owner** | **Cost Estimate** | **Timeframe** |
| | **Description**: "Buy Local" is a win for the entire community . It can increase the number of jobs and the amount of money circulating in the local economy. Increased economic activity has the potential to increase commercial tax collections thereby reducing the strain on residential taxes.<br><br>**Cost/Feasibility**: This would be a low-cost project. | | |
| Co-Benefits: | Mayor/Town Supervisor | Low | 2025-2030 |

| **Strategy 7: Food Scraps Collection** | **Owner** | **Cost Estimate** | **Timeframe** |
|---|---|---|---|
| Promote Food Scraps Collection and "Compost Give Back" schedule | **Description**: The goal of doing this promotion is to expand the food scraps program thus reducing costs for garbage collection and decreasing waste at the landfill. The Compost Give Back Program reduces the need for artificial fertilizers thus reducing the toxicity of runoff from lawns and gardens. It also raises awareness of these issues among the residents. This is a low cost program with a potentially high quality outcome.<br><br>**Cost/Feasibility**: Low Cost | | |
| Co-Benefits: | Town Supervisor | Low | 2025-2030 |
| **Strategy 8: Access to Outdoor Community Assets** | **Owner** | **Cost Estimate** | **Timeframe** |
| Regularly Communicate About Access to Outdoor Community Assets: parks, paths, bike routes, trails and waterfront access | **Description**: Increasing the use of outdoor assets generally Improves the health of the population accessing the waterfront, parks and walking and bicycle paths. Much of the health gain from this program will accrue to frontline communities.<br><br>**Cost/Feasibility**: This would be a low-cost project. | | |
| Co-Benefits: | Mayor/Town Supervisor | Low | 2025-2030 |

# Process, Implementation and Monitoring

## Planning Process for a Shared Vision

Beginning in 2023, The CAPI team solicited input from a variety of sources to draft the vision statement. These outreach efforts are outlined in our public outreach and engagement strategy and include in-person meetings, in-person public outreach and a public survey that was made available to all residents of the community via email and on the municipal web site. The draft vision was shared with a broad swath of the community through tabling at multiple public parks during summer events and at several public events. A draft vision was included in the The Town and Village of Ossining's 2024 GOCAP and was updated several times based on resident and staff feedback.

Both the Town and Village have incorporated community feedback into past plans that have influenced and informed the creation of this CVA+ Adaptation. In 2022, the Town and Village held a booth at the Earth Day Festival to showcase new initiatives from the Shoreline Revitalization Project to residents. This booth provided residents an opportunity to

Our planning process considered diversity, equity, inclusion, and justice. Both the Town and the Village worked to include frontline communities through their separate, earlier Comprehensive Planning processes and the joint Ossining Shoreline Revitalization Project. These efforts utilized multiple formats of outreach including webinars, virtual and in-person workshops, interactive posters and surveys. Both English- and Spanish-language materials were used. . We reached out to residents involved in local community-based organizations for feedback. These organizations included housing, economic development, community services and cultural organizations which target different economic sectors including vulnerable or disadvantaged communities within Ossining. Their feedback was crucial for ensuring this assessment and future actions target vulnerabilities in the community and have real impacts.

## Planning Process for Assessing and Prioritizing Climate Adaptation

### Implementation Plan

The following three pages show the planning priorities of the Town and Village and a projected timeline of their implementation through 2030

| Entity | Village and Town of Ossining: Timeline for Action | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|
| **INFRASTRUCTURE** | | | | | | | |
| Town/Village | Update Hazard Mitigation Plan | X | X | | | | |
| Town/ Village | Energy-Use Reduction Goals in Municipally-Owned Buildings | | X | X | X | X | X |
| Town/Village | Install Solar Panels at Municipal Buildings & Facilities | X | | X | X | X | |
| Village | Consider Legislation enabling Battery Energy Storage for return back into grid | X | | | | | |
| Town/ Village | Implement cost-effective solutions from CAD/ Shoreline Revitalization Project | | | X | X | | |
| Town/ Village | Implement Water Conservation Policy for Municipal Buildings | | X | X | | | |

| Entity | Village and Town of Ossining: Timeline for Action | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|
| **ENVIRONMENTAL** | | | | | | | |
| Town/ Village | Convert fully to Electric Lawn Care Equipment | X | X | X | | | |
| Town/Village | Move to Electric Vehicles as Cost Effective and Funds Available | X | X | X | X | X | X |
| Town/ Village | Continue to Establish and Promote Pollinator Pathways | X | X | X | X | X | X |
| Village | Update Tree Protection Legislation | X | X | | | | |
| Town/ Village | Create and Adopt a Green Purchasing Policy | | | X | | | |
| Village | Conduct a Natural Resource Inventory | X | X | | | | |
| Town/ Village | Formalize a Parks Maintenance Plan | | | X | | | |
| Village | Update Local Waterfront Revitalization Pla | | X | X | | | |

| Entity | Village and Town of Ossining: Timeline for Action | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|
| **SOCIAL** | | | | | | | |
| Village | Protect and Preserve Kill Brook with 30 Water Street Project | X | X | X | | | |
| Town/Village | Promote Preparedness Planning on Municipal Web Sites | X | X | X | X | X | X |
| Town/ Village | Develop Post-Event Damage Assessment Plan and Communication Strategy | | | X | X | | |
| Village | Review/Extend Communications Plan to Residents | X | X | X | X | X | X |
| Town/ Village | Introduce (Town) and Expand (Village) Project MOVER | X | X | X | | | |
| Town/ Village | Promote "Buy Local" Campaign | X | X | X | X | X | X |
| Town | Promote Food Scraps Collection and "Compost Give Back" schedule | X | X | X | X | X | X |
| Town/ Village | Regularly Encourage Access to Outdoor Community Assets | X | X | X | X | X | X |

## Monitoring

While some of the actions in this Climate Vulnerability and Adaptation Plan are underway, the Town and Village of Ossining will continue to engage with stakeholders in further refining and implementing the actions that have not been completed. Once the Plan is adopted, next steps include:

- Disseminate the Plan to the relevant departments to review each of the strategies, assign organizational responsibility to relevant department owners and initiate a process for implementation with key stakeholders.
- Ongoing outreach efforts to key stakeholders and community members.
- Identify staff and key sources of funding, where not already mentioned.
- Gather bids for contracted services and equipment where necessary.
- Apply for relevant grants to keep these actions financially obtainable.

Establishing an implementation and monitoring process enables the Town and Village of Ossining to track the impacts of the recommended strategies included in this Plan. Assessing the implementation status of the actions will allow for the determination of whether the action is performing well or to identify corrective measures. This process is also an opportunity to understand the barriers to implementation and identify best practices or new opportunities for moving forward.

With the approval of this Climate Vulnerability Assessment and Adaptation Plan, the Village of Ossining and Town of Ossining agree to revisit this Plan at least every 7 years, or following a major climate event, or when other relevant circumstances change, such as the release of new climate change projections or an evaluation of how those projections may impact assets, systems, and vulnerable populations in the community.

# Conclusion

This Climate Vulnerability Assessment integrates scientific data and the perspectives of residents and key groups regarding climate hazards in our community, county, and region. The Assessment outlines, analyzes, and prioritizes the impacts of priority climate hazards on key assets in Ossining. Throughout the assessment, diverse and thoughtful feedback was received at each stage of the process. The assessment reflects the dedication of municipal officials, staff, the Town and Village's Councils, commissions, and numerous residents to safeguarding identified unique and irreplaceable assets.

Acknowledging that perceptions and priorities evolve, the CAPI Adapt Team is dedicated to continuing the dialogue, as well as climate vulnerability, adaptation, and resilience planning. The next steps include determining and prioritizing adaptation strategies in a climate adaptation chapter of our Climate Action Plan. The authors are confident that this report will inform and contribute to future municipal plans and development projects, aiding the Town and Village of Ossining in cost-effective and efficient climate adaptation efforts.

Ossining commits to reviewing this Assessment at least once every seven years. A periodic review of the Assessment can help inform other municipal planning initiatives. Through ongoing dialogue, research, prioritization, reassessment, and planning, the authors envision this Climate Vulnerability Assessment as a living document, the cornerstone for a comprehensive Climate Action Plan, and a key component of our resilient vision guiding the Town and Village of Ossining's long-term sustainability efforts.

# Appendix A: References


*1 NOAA National Centers for Environmental Information, Monthly Global Climate Report for Annual 2023, published online January 2024, retrieved on February 7, 2024 from https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202313.*

*2 NOAA National Centers for Environmental Information, Monthly National Climate Report for Annual 2023, published online January 2024, retrieved on Jan 31, 2024 from https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202313.*

*3 Stevens, A., & Lamie, C., Eds. (2024). New York State Climate Impacts Assessment: Understanding and preparing for our changing climate. https://nysclimateimpacts.org.*

*4 Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano, and W.Solecki. 2014. Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information. New York State Energy Research and Development Authority (NYSERDA), Albany, New York.* https://www.nyserda.ny.gov/climaid.

*5 Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure NYS 2100 COMMISSION* https://www.cakex.org/sites/default/files/documents/NYS2100.pdf.

*6 Hudson, Scenic. "Sea Level Rise Mapper ."* Scenichudson.Maps.Arcgis.Com*, Scenic Hudson, https://scenichudson.maps.arcgis.com/apps/MapJournal/index.html?appid=3a3d0dc3884c4637ad0a51f4aa912189. Accessed 31 Jan. 2024.*

*7 US Census Bureau; Town of Ossining https://data.census.gov/profile/Ossining_town,_Westchester_County,_New_York?g=060XX00US3611955541*

*8 US Census Bureau; Village of Ossining https://data.census.gov/profile/Ossining_village,_New_York?g=160XX00US3655530*

# Appendix B: Key Terms

*Key climate adaptation terms from the [NY State Template for Local Climate Change Adaptation Plan](), p. 13, are provided below for informational purposes. Not all are used in this document but are commonly used in climate adaptation work.*

**Adaptation (climate change):** Actions that reduce the level of physical, social, or economic impact of climate change and variability, or take advantage of new opportunities emerging from climate change (Rosenzweig et al., 2011). It includes reducing the vulnerability of people, places, and ecosystems to the impacts of climate change.

**Adaptive capacity:** The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2014).

**Climate change:** A statistically significant variation in either the mean state of the climate, most often surface variables such as temperature, precipitation, and wind, or in its variability, persisting for an extended period (typically decades or longer) (Wuebbles et al., 2017).

**Climate change effects:** The physical effects of anthropogenic climate change, including changes in average temperatures, precipitation rates, sea level rise and ocean temperatures.

**Climate change impacts:** The impacts experienced by a human, natural system, or man-made system as a result of climate variation including physical changes in average conditions or extreme weather. Examples of climate change impacts include flooding of homes or ecosystem changes (Vogel et al., 2016).

**Drought:** A period of unusually persistent dry weather that persists long enough to cause a water supply shortage (NOAA, 2015).

**Ecosystem-based Adaptation (EbA):** The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change (IPCC, 2014).

**Ecosystem services:** Ecological processes or functions having monetary or non-monetary value to individuals or society at large. These are frequently classified as (1) supporting services such as productivity or biodiversity maintenance, (2) provisioning services such as food or fiber, (3) regulating services such as climate regulation or carbon sequestration, and (4) cultural services such as tourism or spiritual and aesthetic appreciation (IPCC, 2014).

**Exposure:** The degree to which elements of a system are in direct contact with climate variables, may be affected by long-term changes in climate conditions or by changes in climate variability, including the frequency and magnitude of extreme weather (Rosenzweig et al., 2011).

**Extreme heat:** Individual days with a maximum temperature at or above 90°F or above 95°F; threshold used depends on the region within the state (Rosenzweig et al., 2011).

**Extreme cold:** Individual days with a maximum temperature at or below 32°F or below 0°F; threshold used depends on the region within the state (Rosenzweig et al., 2011).

**Extreme precipitation:** Event with more than 1, 2, or 4 inches of precipitation over a 24-hour period; threshold used depends on the region within the state (Rosenzweig et al., 2011).

**Extreme weather:** A period of abnormal weather conditions that can negatively affect humans, natural and man-made resources. Extreme weather is often used as an umbrella term referring to a combination of extreme heat, extreme cold, extreme precipitation, or extreme wind.

**Extreme wind:** Period with sustained or gusting wind speeds high enough to cause damage to trees, power lines, and other types of natural or man-made resources (NOAA, n.d.).

**Flood or flooding:** A temporary inundation of normally dry land area caused by an increase in water levels in nearby water bodies including lakes, rivers, estuaries, and oceans or by localized accumulation of precipitation (FEMA, 2017).

**Greenhouse gas (GHG):** Any gas that absorbs infrared radiation in the atmosphere; examples include carbon dioxide, methane, nitrous oxide, ozone, and water vapor.

**Heat wave:** Three consecutive days with maximum temperatures above 90°F (Rosenzweig et al., 2011).

**Heat index:** A measure indicating the level of discomfort for the average person is thought to experience as a result of the combined effects of the temperature and humidity of the air.

**Maladaptation:** Adaptive actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change, or diminished welfare, now or in the future (IPCC 2014).

**Mitigation (climate change):** Actions that reduce the levels of greenhouse gases in the atmosphere; includes reducing emissions of greenhouse gases and enhancing sinks (things that absorb more greenhouse gases than they emit). Examples include switching to renewable energy sources and implementing energy efficiency measures.

**Nature-based solutions (NbS):** Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits (IUCN, 2016).

**Resilience:** The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation (IPCC, 2014).

**Sensitivity:** How much a system is directly or indirectly affected by changes in climate conditions (e.g., temperature and precipitation) or specific climate change impacts (e.g., sea level rise and increased water temperature). If a system is likely to be affected as a result of projected climate change, it should be considered sensitive to climate change.

**Vulnerability:** The degree to which systems are susceptible to, and unable to cope with, adverse impacts of climate change (Rosenzweig et al., 2011). Generally, systems that are sensitive to climate and less able to adapt to changes are considered to be vulnerable to climate change impacts.

# Appendix C: Workshop Worksheets

## Community Systems and Assets

PART 1: EXPOSURE MATRIX

| Community Systems & Assets | Climate Hazards | | |
|---|---|---|---|
| | Increasing temperatures | Rising sea levels | Changing precipitation patterns |
| Homes, businesses, and public buildings | | | |
| Transportation systems | | | |
| Parks and natural areas | | | |
| Water and wastewater infrastructure | | | |
| Energy infrastructure | | | |
| Public health and healthcare | | | |
| Food supply/distribution | | | |
| Communications infrastructure | | | |
| Community and cultural spaces | | | |
| Educational institutions | | | |
| Emergency response | | | |
| Farms and agriculture | | | |
| Local economy and jobs | | | |
| Other: | | | |

## Hazard-System Pair

PART 2: VULNERABILITY NARRATIVE

| Hazard-System Pair | Describe Potential Consequences<br>*If this hazard impacts this community system, what could happen? Be as specific (e.g. locations, particular facilities) as you can.* | Who Could Be Affected?<br>*Consider equity – who may be more adversely affected and why?* | Describe the System's or Community's Ability to Adjust<br>*What resources/alternatives are available?* |
|---|---|---|---|
| *Rising temperatures x energy infrastructure* | *Can cause utilities to implement blackouts, power rotation*<br><br>*Damage to power infrastructure*<br><br>*Loss of power for homes, EVs, government services* | *Seniors*<br><br>*People with health conditions (e.g. insulin must be refrigerated)*<br><br>*School-aged children*<br><br>*People without access to cooling* | *Town library serves as a cooling center*<br><br>*Essential service providers have plans in place for outages* |

## Prioritization Template

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | VULNERABILITY NARRATIVE<br>*Paste or transcribe notes from your Vulnerability Narrative Activity here* | | | | PRIORITIZATION | |
| 2 | Hazard-System Pair | Describe Potential Consequences<br>*If this hazard impacts this community system, what could happen? Be as specific (e.g. locations, particular facilities) as you can* | Who Could Be Affected?<br>*Consider equity – who may be more adversely affected and why?* | Describe the System's or Community's Ability to Adjust<br>*What resources/alternatives are available?* | Prioritize for Adaptation Planning?<br>*Use an 'X' to indicate that a hazard-system pair should be prioritized* | Justify Your Decision<br>*Explain: why is this pairing being prioritized? Did it come up in community engagement? Is it highly critical to the functioning of the community? Does it reduce risks to vulnerable populations?* |
| 3 | Rising temps x energy infrastructure | *Paste or transcribe from your Vulnerability Narrative* | ... | ... | X | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |

## Resilience Assets Workbook

| | INFRASTRUCTURE - BUILDINGS AND FACILITIES | | | | | | |
|---|---|---|---|---|---|---|---|
| Goal | Category | Infrastructure Asset | Sea Level Rise | Changing Precipitation Patterns | Increasing Temperatures / Heat | Location (if relevant) | Priority (considering exposure, sensitivity and adaptive capacity and vulnerable populations) |
| Goal: Address aging infrastructure | | | | | | | |
| | 1 Government Buildings | | | | | | |
| | 1.1 | Municipal Hall / Municipal Court | Medium | Medium | Medium | | |
| | 1.2 | Police Station | Medium | Medium | Medium | | |
| | 1.3 | Department of Public Works (DPW) | High | Medium | Medium | | High |
| | 1.4 | Community Center | High | Medium | Medium | | High |
| | 1.5 | Fire Houses | High | Medium | Medium | | High |
| | 2 Residential Buildings | | | | | | |
| | 2.1 | Homes (single and multifamily dwellings) | Medium | | | | |
| | 2.2 | Apartment buildings / complexes | Medium | | | | |
| | 3 Government Owned Facilities | | | | | | |
| | 3.1 | Pump houses, stations and pumps | Medium | | | | |
| | 3.2 | Wastewater facility | Medium | | | | |
| | 3.3 | Garages / Depots | Medium | | | | |
| | 3.4 | Waste disposal facility | Medium | | | | |
| | 3.5 | Compost facility | High | | | | |
| | 4 Downtown Infrastucture | | | | | | |
| | 4.1 | Downtown businesses | | | | | |
| | 4.2 | Community and cultural spaces | | | | | |

# Appendix D: Key Documents

2020 Town of Ossining Comprehensive Plan with Sustainability Elements
2024 Town of Ossining GOCAP
Town of Ossining Annex, Westchester County Hazard Mitigation Plan 2021
2009 Village of Ossining Comprehensive Plan
2021 Village of Ossining Comprehensive Plan
2024 Village of Ossining GOCAP
Village of Ossining Annex, Westchester County Hazard Mitigation Plan 2021
Ossining Shoreline Revitalization Project

# Appendix E: Additional Adaptation Considerations

The following tables are lists of non-priority adaptation actions either in progress or under consideration. They have been organized by area of focus similarly to the priority adaptation actions listed in the section entitled: **Planning Process for Assessing and Prioritizing Climate Adaptation.**

| Entity | Village and Town of Ossining: Additional Considerations | Notes |
|---|---|---|
| **INFRASTRUCTURE** | | |
| Town/ Village | Continue upkeep of back-up generators for municipal buildings | All Village municipal buildings, including Village-owned firehouses, have dedicated or portable backup generators at this time. |
| Village | Prepare for Emerging Threats to Drinking Water Taste and Quality via Construction of New Indian Brook Water Treatment Plant | Construction began in Summer 2024-- new Plant expected to come online in late 2027 (39 month construction), integrating state-of-the-art technology to improve quality while increasing potential output |
| Village | Install rooftop rain garden at new Indian Brook Water Treatment Plant | GIGP grant funding of $160K |
| Town | Conduct Feasibility Assessments for Town Highway Department Relocation Out of Flood Zone and/or Evaluate Relocation/ Rebuilding, Rebuilding On-Site, or Retrofitting Existing Facility with Storm Hardening and Resiliency Measures | |
| Village | Assess/Improve Existing Cooling and Heating Center | The Joseph G. Caputo Community Center serves as Ossining's centrally-located Heating/ Cooling Center. Though it is seldom used at present, there is value in continuing to review usage and consider allocting additional resources if usage increases. |
| Town | Evaluation of Back-up Power for Capacity Sewer lift stations: OBCC • Deerfield - Fawn Court • Deerfield - Whitetail Circle • Fox Hill • Crotonville • North State Road • Parker Bale • Mystic Pointe | |

| | | |
|---|---|---|
| Town | Continue the Town-wide replacement of old CRP stormwater piping with smooth-bore piping as funding becomes available. | |
| Village | Acquire a Trailer to Store Sheltering Items Closer to the Community Center (Emergency Shelter) | |
| Village | Consider Public/ Private Partnership to Improve Rockledge Avenue and Revolutionary Road Stormwater System | Cannot be done without improvements on private property owned by Regency Shopping Center (behind CVS) |
| Town/ Village | Assess Low-Lying Municipal Buildings for Floodproofing | Gourdine Park Kiosk (Village) and Ossining Boat and Canoe Club (Town) are in the flood plain. |
| Town | Implement Findings and Recommendations of the Feasibility Study addressing the flood vulnerability of the Ossining Boat and Canoe Club | |
| Town/ Village | Encourage use of permeable surfaces on Municipal and Private Property | |
| Village | Consider Village-Wide Flood Study | |
| Town/ Village | Advocate for Buried Utility Lines on New Development Projects | |
| Village | Incorporate Air Source Heat Pumps in Village-Owned Firehouses as practical | |
| Town/ Village | Plant Rain Gardens to Treat Stormwater as practical | |

| Entity | Village and Town of Ossining: Additional Considerations | Notes |
|---|---|---|
| **ENVIRONMENTAL** | | |
| Village | Consider development of a Village-wide Tree Maintenance Program | |
| Town | Consider Implementing a Forest Management Plan | |
| Town/Village | Consider Implementing a Meadows Management Plan | |
| Town/ Village | Continue Tree Planting initiatives (NYPA Tree Power program, Tree City, Tree City Growth Award) | |
| Town/ Village | Consider Implementing a Native Plant Planting Inititiative | |
| Town/ Village | Consider Introducing a Tree-Saving (Vine Cutting) Initiative in Municipal Parks | |
| Town/ Village | Consider Introducing a Maintenance of Buffers Plan | |
| Town/ Village | Consider Implementing a Shade Structures Policy | |
| Town/ Village | Update Ossining Open Space Plans | |
| Town | Invest in Municipal Land Conservation | |
| Town/ Village | Move Towards a Ban of "Turf" Pesticides on Municipal Land and Public Parks | |
| Town/ Village | Promote Leave Leaves Alone for residents and mulching done by the municipality | |
| Town/ Village | Enlist EACs and Green Ossining to provide education on climate hazards, planting and nature-based resileinecy topics community-wide | |
| Town/ Village | Encourage Use of Healthy Building Materials through Code Changes | |
| Village | Continue Water Quality Testing for PFAS | |

| | | |
|---|---|---|
| Town/ Village | Consider Pursuing Storm Ready Certfication | |
| Town | Eliminate Disposable Plates/Silverware/Cups from Senior Kitchen | |
| Town | Improve Drainage along the Trails in Ryder Park | |
| Town | Re-use Felled Trees for Garden Structures, Park Furniture, Mulch | |
| Town | Perform Water Quality Testing to Support Swimming in Louis Engel Park | |

| Entity | Village and Town of Ossining: Additional Considerations | Notes |
|---|---|---|
| **SOCIAL** | | |
| Town/Village | Encourage and Support Community Gardens | |
| Town/ Village | Explore and Implement Climate Justice Initiatives | |
| Town/ Village | Ensure Emergency Management Plans have been communicated widely, and specifically to flood-prone property owners/ residents | |
| Town/ Village | Provide training programs for key personnel, including incident training exercises and knowledge of the approved employer public health emergency plan per state requirements | |
| Town/ Village | Train municipal staff to be able to incorporate climate change resilience into their daily work, as well as in the use of planning tools for this purpose | |