

greenWP



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INTRODUCTION

The City of White Plains is committed to protecting and preserving its natural resources and has established itself as a leader in supporting clean energy and other climate change mitigation measures. It is vital that the City continue to respond to climate change and promote sustainability through the lens of both mitigation and adaptation.

greenWP identifies and supports existing environmental resources and green initiatives, with the goal to develop new policies and programs that mitigate climate change, promote sustainable development, and protect ecological systems and the environment.

greenWP addresses the following TOPICS:

- Environment, Natural Resources, and Open Space
- Clean Energy
- Decarbonization
- Climate Resilience

greenWP highlights the City's ongoing leadership and future plans related to principles of sustainability, including preservation of environmental resources, climate change mitigation, and climate change adaptation. This section of One White Plains identifies policies, plans, and capital programs to protect valuable natural resources, reduce greenhouse gas emissions and energy consumption, and adapt to impacts of climate change.

Studies from the International Panel on Climate Change (IPCC), Environmental Protection Agency (EPA), New York State Department of Environmental Conservation

(NYSDEC), and other organizations around the world have demonstrated that we are facing a climate crisis ([click here to view the Climate Change Primer](#)). The residents of the City of White Plains believe that it is our responsibility to act now so that we can leave behind a brighter future for our children. We have already begun to see the impacts of climate change around the world and in our own backyards, including flash flooding, extreme heat waves, wildfires, drought, rising sea levels, and other dangerous climate hazards.

Inadequate action will lead to a future that is less prosperous and less safe for subsequent generations. But we have an opportunity to act, both to reduce our contribution to climate change, as well as to protect our community by adapting to impacts that will continue to affect White Plains in the future. Actions to mitigate our contribution to climate change must come from all levels—from nations and large corporations, but also from small and medium sized cities like White Plains.

greenWP seeks to respond to climate change and promote sustainability through the lens of both **mitigation and adaptation**. The impacts of global warming and the changing climate have been projected for decades. In recent years, the impacts have been observed globally as well as in New York and the Mid-Hudson region— and these adverse impacts will continue to worsen over the lifespan of this plan ([click here to learn about observed and projected impacts of climate change](#)). As a result, the City of White Plains believes that it is our responsibility to mitigate our role in contributing to climate change. Given that the climate is already changing, we also need to adapt to those changes so that our community remains resilient in the future.

Defining Climate Change Mitigation and Adaptation

Climate Change Mitigation

A human intervention to reduce greenhouse gas emissions that contribute to climate change.



Source: Ramboll

Climate Change Adaption

Adjusting to actual or projected changes in climate in order to moderate harm and create beneficial opportunities.



greenWP Equity and Inclusion

Communities of color and low-socioeconomic status communities are disproportionately impacted by climate change and environmental harm. It is a guiding principle of oneWP that the City approaches all future initiatives with the objective to advance social justice. For instance, future capital investments made by the City to address climate change mitigation and adaptation should prioritize the City's most vulnerable neighborhoods and areas, and initiatives that pertain to programs or campaigns should be met with effective outreach and educational efforts to build awareness and understanding. The *strengthenWP* Element further addresses initiatives around information sharing, social services and emergency response systems.

Local Leadership

White Plains has a role to play to reduce emissions, increase our own resilience to climate change impacts and engage with our community. The goal is to ensure that efforts are inclusive and that the social, environmental, and economic benefits of responding to the climate challenge are equitably distributed. To achieve these goals, cities like White Plains must take actions in the public sector, but also partner with our neighbors in the region, local residents,

and businesses to establish and achieve mitigation targets and resilience goals ([click here to learn about U.S. and International actions on Climate Change](#)).

Adaptation strategies must emerge from local priorities—even if White Plains seeks out state and/or federal funds, the vision must come from the community. State and federal funds often come with guidelines and requirements about how they can be spent. However, White Plains must develop a community-driven, participatory approach to identify local priorities for climate change mitigation and adaptation in order to capitalize on stakeholder knowledge and build consensus.¹

The City of White Plains has already taken a leadership role, both locally and regionally, to mitigate the impacts on the climate. The Mayor, Common Council, City departments, and the Sustainable White Plains Committee have all prioritized sustainability initiatives, which have led to significant strides in recent years.

¹ A Managed-Participatory Approach to Community Resiliency: A Case Study of New York State's Response to Extreme Weather Events, Simon McDonnell,¹ Swati Desai,² Daniel Berkovits,¹ Pooya Ghorbani,² Maria Jessa Cruz,² Renata Silberblatt,¹ Alexander Breinin,¹ and Xavier Williams¹. ¹ Governor's Office of Storm Recovery (New York) ² Rockefeller Institute of Government, SUNY. June 2016.

City of White Plains Ongoing Sustainability Initiatives:

- In 2014, the City of White Plains registered with the NYS DEC’s Climate Smart Communities program which supports local governments in building more sustainable climate action programs. The City passed the Climate Smart Communities pledge to become a Registered Climate Smart Community (CSC). As a CSC, the City can access funding through NYS DEC’s CSC Grant program, State-level recognition for local leadership, and resources/guidance in implementing climate smart planning initiatives. The Climate Smart Communities Task Force was created to establish a baseline for the City’s current emissions, recommend reduction targets, and identify new strategies for energy efficiency. As of April 2023, the City was officially certified as a Bronze Level Climate Smart Community, recognizing the many significant climate smart actions that White Plains has accomplished.
- The City is a municipal member of the New York State Energy Improvement Corporation (EIC). EIC is a non-profit organization and local development corporation that is focused on helping property owners reduce energy waste, save money, and improve the quality of their buildings through clean energy projects involving energy efficiency and renewable energy.
- White Plains was designated as a NYSERDA Clean Energy Community in 2017. Actions taken by the City to qualify for this program include implementing a Clean Fleets Policy, conducting community campaigns on energy efficiency, conducting Energy Code Enforcement Training for City staff, implementing Property Assessed Clean Energy (PACE) financing, and adopting the Unified Solar Permit.
- The White Plains Community Solar Project, started in 2019, is a groundbreaking project that sets the standard for municipal solar initiatives in New York. The project received the 2021 Mayors Climate Protection Award. The US Conference of Mayors recognized Mayor Roach as one of the honorees for his leadership in implementing the White Plains Community Solar Project as one strategy to address the climate crisis.

These actions demonstrate how White Plains has already implemented a range of strategies to reduce our impact on climate change. greenWP provides a path forward to help guide future actions in White Plains to support both mitigation and adaptation to climate change.

TOPIC #1: ENVIRONMENT, NATURAL RESOURCES AND OPEN SPACE

The City is committed to protecting and preserving our environment and natural resources. Healthy and diverse natural resources, natural open space and ecosystems support the health and well-being of the community. These resources provide a wide range of benefits, from natural habitats and ecosystem functions, to recreation, to critical resources such as drinking water and air quality. Strategies that help to protect and preserve our natural and environmental resources can also support other key objectives of One White Plains, such as promoting smart growth, reducing our contribution to climate change, and increasing access to alternative transportation.

Key natural and environmental resources in White Plains include watersheds, wetlands, waterways and waterbodies, tree coverage and the natural open spaces where many of these features are located.



White Plains Reservoir #2

Objectives

ENVIRONMENT

Protect the environment by promoting policies that mitigate environmental hazards and protect environmental resources

It is critical to protect natural habitats and ecosystems in order to ensure local quality of life. Watersheds, wetlands, waterbodies, and natural open spaces are vital assets that provide value for the environment and the health of our community. It is important to balance growth and development with protection of our natural areas.

NATURAL RESOURCES

Conserve natural resources to protect water quality, waterways and wetlands, and other environmental features.

The conservation of natural resources is related to larger efforts around environmental management. For the purposes of this plan, natural resources focus on air quality, water quality, and tree coverage.

OPEN SPACE

Protect and expand open spaces to create a network of natural areas, parks, and recreational assets.

The stock of open space in White Plains should include a balance of natural areas that add to the overall quality of the environment while also providing public access and recreational opportunities where feasible. While *playWP* provides an account of parks and recreational opportunities in White Plains, *greenWP* reinforces the importance of quality natural open spaces and opportunities to coordinate the natural environment with broader parks and recreational assets.

EXISTING CONDITIONS

Current Regulations

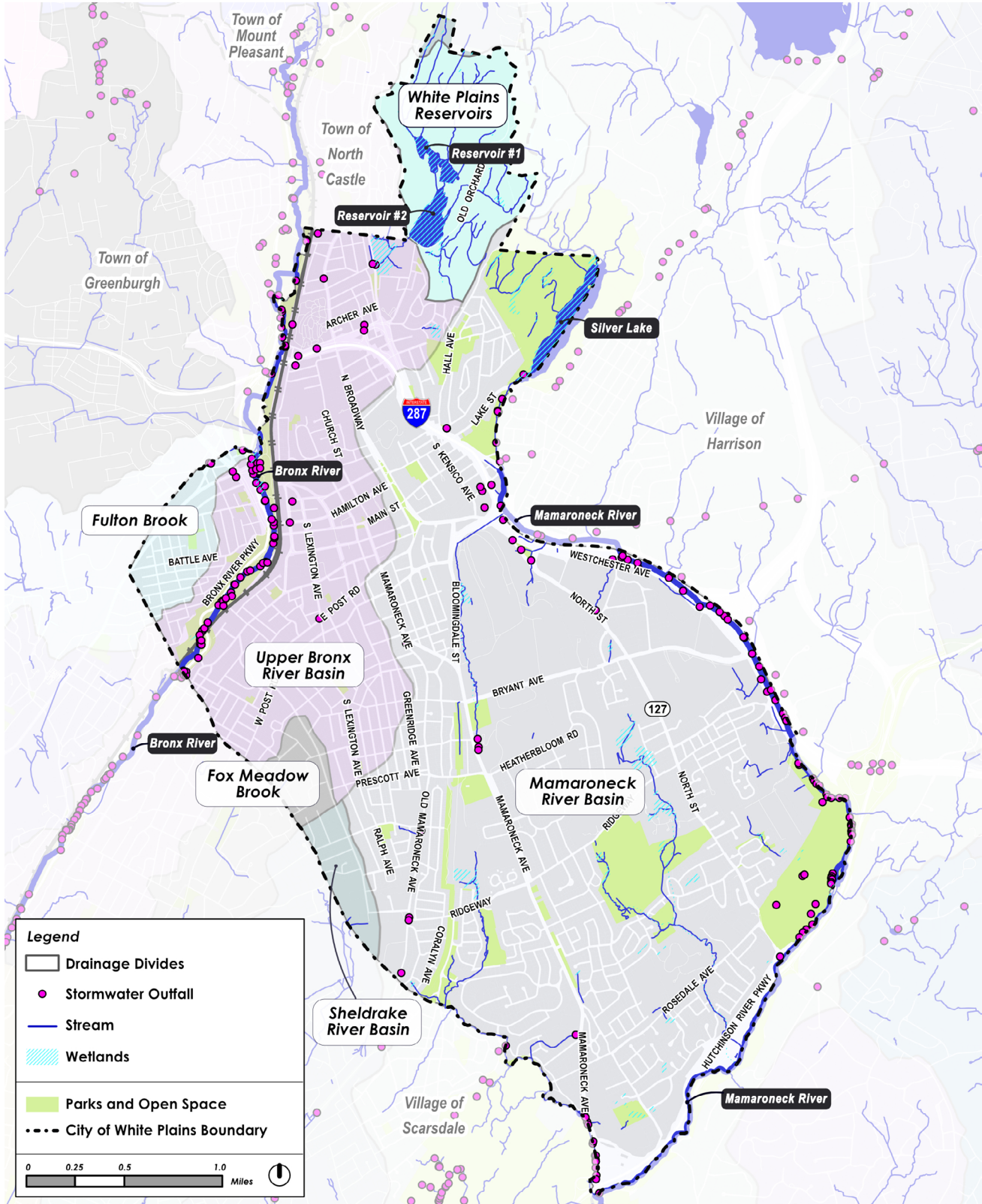
The City's Municipal Code (Chapter 3-5) defines environmentally sensitive sites (lots, plots, or parcels) as land that contains at least a portion of an environmental feature such as water resources (watercourses, ponds, lakes, reservoirs, etc.), floodplains, steep slope areas, rock outcroppings, or is located within a prescribed distance of such features. Section 2-5-3 of the Municipal Code provides specific detail for determining the environmental sensitivity of a site. These regulations are in place to protect the safety of development and to limit adverse impacts on natural features.



Silver Lake

Figure 1: Watershed Drainage Divides, Stormwater Outfalls, Waterbodies and Wetlands

Sources: City of White Plains, Westchester County, BfJ Planning



Watersheds

Watersheds are areas of land that collect and drain water (i.e. stormwater) into waterbodies (lakes, streams, reservoirs, and wetlands). There are two major watersheds in White Plains: the Bronx River Basin and the Coastal Long Island Sound Basin. Figure 1 details drainage divides that make up these two key watersheds.

Waterbody water quality is impacted by how water moves through watersheds: water runoff from upland areas can convey pollutants into waterbodies which compromise both the natural environment as well as drinking water in the case of reservoir contamination. When stormwater enters watersheds too quickly for the land, retention areas, or waterways to absorb it, flooding can also occur.

Note that **stormwater** refers to water that originates from rain events or meltwater from snow. The majority of stormwater is either absorbed into the ground, becoming groundwater, or becomes surface runoff that is conveyed to local rivers, streams, or bodies of water. Stormwater sewer lines play an important role in conveying water to local waterways or retention areas. Figure 1 maps stormwater outfalls which are concentrated along the Bronx and Mamaroneck Rivers.

Waterbodies and Watercourses

Vital to water supply, the City maintains two key reservoirs in the north of the City, White Plains Reservoir #1 and White Plains Reservoir #2. Additionally, Silver Lake is located east of these reservoirs and is situated within a larger land area designated as the Silver Lake Preserve.

The Bronx River originates just north of White Plains near Kensico Lake and flows through a portion of northwest White Plains, generally aligned with the Bronx River Parkway. The Mamaroneck River extends from the north at Silver Lake and flows roughly seven miles south where it empties into the Mamaroneck Harbor and Long Island Sound. Around White Plains, the Mamaroneck River is generally aligned with both the Cross Westchester Parkway and the Hutchinson River Parkway.



Mamaroneck River Head

Wetlands

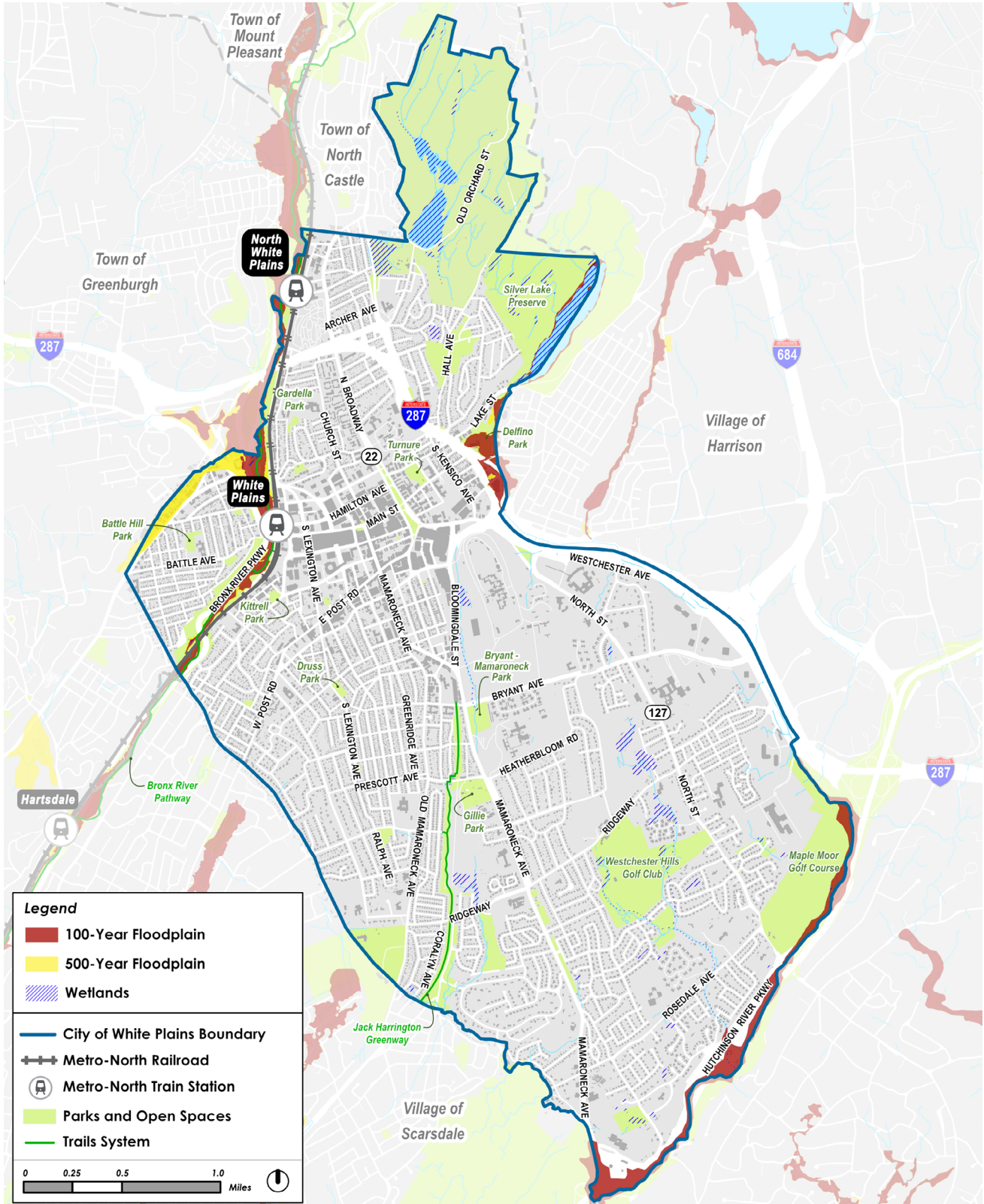
The City's wetlands are primarily wet meadow or forested areas that experience groundwater saturation after rain events and can contribute to conditions of localized flooding. Figure 1 shows wetland areas across White Plains. In northern White Plains, the freshwater emergent wetland east of the Central Westchester Parkway near Cloverdale Avenue is known as an area that often floods into the surrounding neighborhood. Wetlands provide critical buffers between floodplains and development but also add ecological diversity through plant and animal habitats.

Floodplains

Federal Emergency Management Agency (FEMA) designated floodplains in White Plains are located adjacent to the Bronx River and the Mamaroneck River. Figure 2 shows the 100- and 500-Year Floodplains in White Plains. The 100-year floodplain represents areas where there is an estimated 1% chance of flooding each year. Note that this map does not account for other areas that are prone to localized flooding as a result of heavy rain storms in areas where sewer lines might be over capacity or not present.

Figure 2: FEMA 100- and 500-Year Floodplains

Sources: City of White Plains, Westchester County, Federal Emergency Management Agency (FEMA), BfJ Planning



Natural Open Space Resources

Significant natural open space areas include lands that are forested and/or have ecological importance. The Silver Lake Preserve and the City's Water Supply lands (shown in Figure 3) are predominantly forested and contain key water resources. Together, these lands contain over 500 acres within White Plains City limits. The Bronx River Parkway lands as well as the Jack Harrington Greenway and Ridgeway Nature Trail also provide White Plains with significant publicly owned tree-covered or forested land. Natural open spaces in White Plains include Silver Lake Preserve, Bronx River Parkway Reservation, Baldwin Farm, Peckham Park, Liberty Park, and the Ridgeway Nature Trail. Saxon Woods Park is located just south of White Plains in the Village of Scarsdale and the Town of Mamaroneck. A majority of this 700-acre property is forested and it is bisected by the Mamaroneck River. In addition to natural open space areas, Figure 3 shows the broader open space network, inclusive of smaller open spaces that vary in terms of quality greenspace and wildlife habitat.

Tree Canopy

In addition to the largest reserves of forested lands mentioned above, the City's overall tree canopy is an asset that adds to the local environment. The tree canopy includes tree-lined streets and trees found in private residential yards. Environmental and public health benefits of a robust tree canopy include: the reduction of street-level air pollution, alleviation of heat stress during summer months, sustaining wildlife habitats, and promoting overall community aesthetics that enhance the desirability of the public realm.



Source: City of White Plains



Jack Harrington Greenway

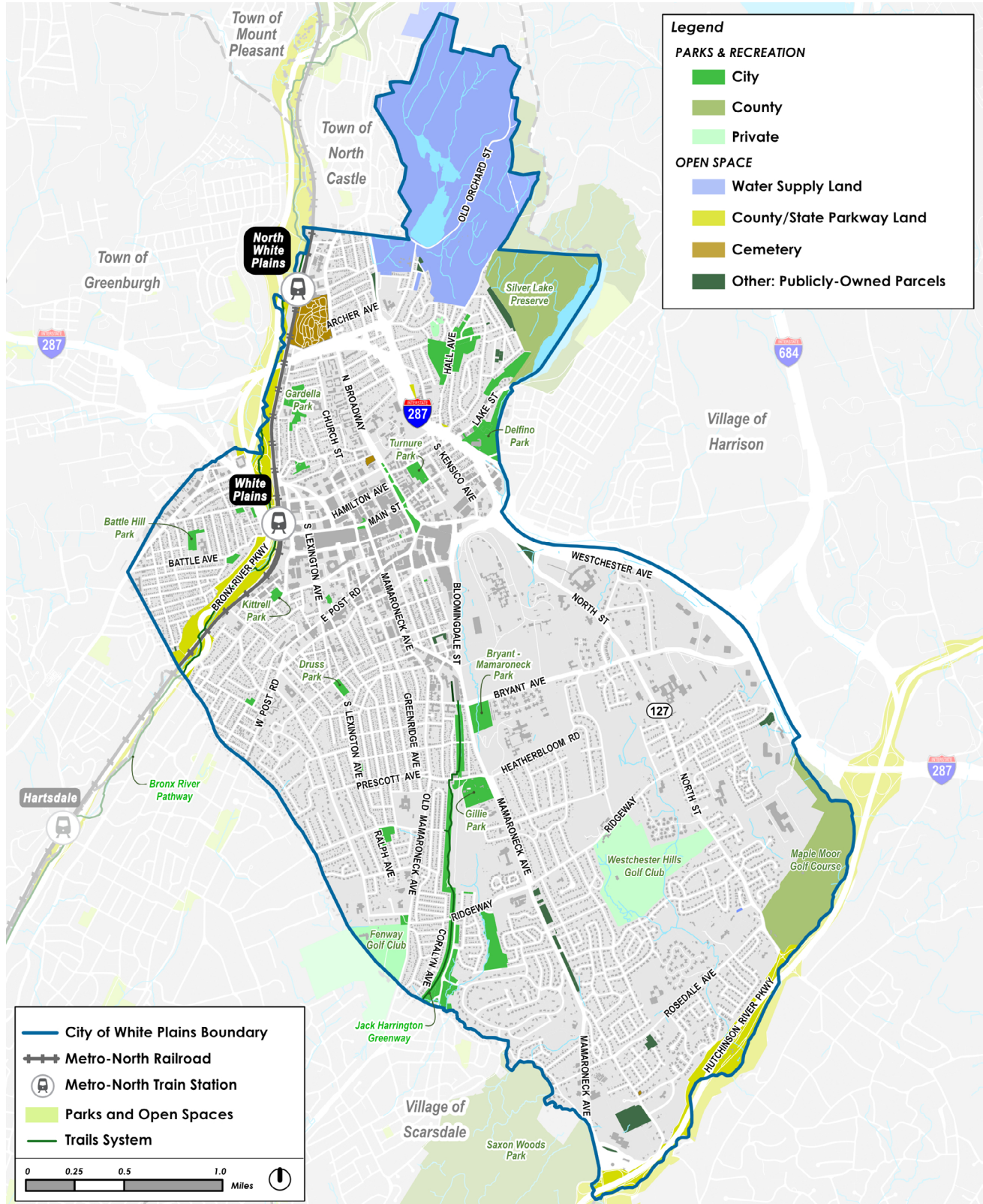
Source: City of White Plains



Source: City of White Plains

Figure 3: Open Space Network

Sources: City of White Plains, Westchester County, BFI Planning



Steep Slopes

Steep Slope areas are characteristic of White Plains and cover about 14% of the City's land. Their protection preserves the City's natural character while reducing erosion and slope instability. Figure 4 shows that while steep slopes are located in many areas of the City, areas with higher prevalence include: the northern portion of the City east of North Broadway, particularly in the water supply lands and along the western edge of the Silver Lake Preserve; the Battle Hill and Fisher Hill neighborhoods; and, generally in the southern portion (i.e. along Rosedale Avenue) and the City's eastern edge along the Mamaroneck River.

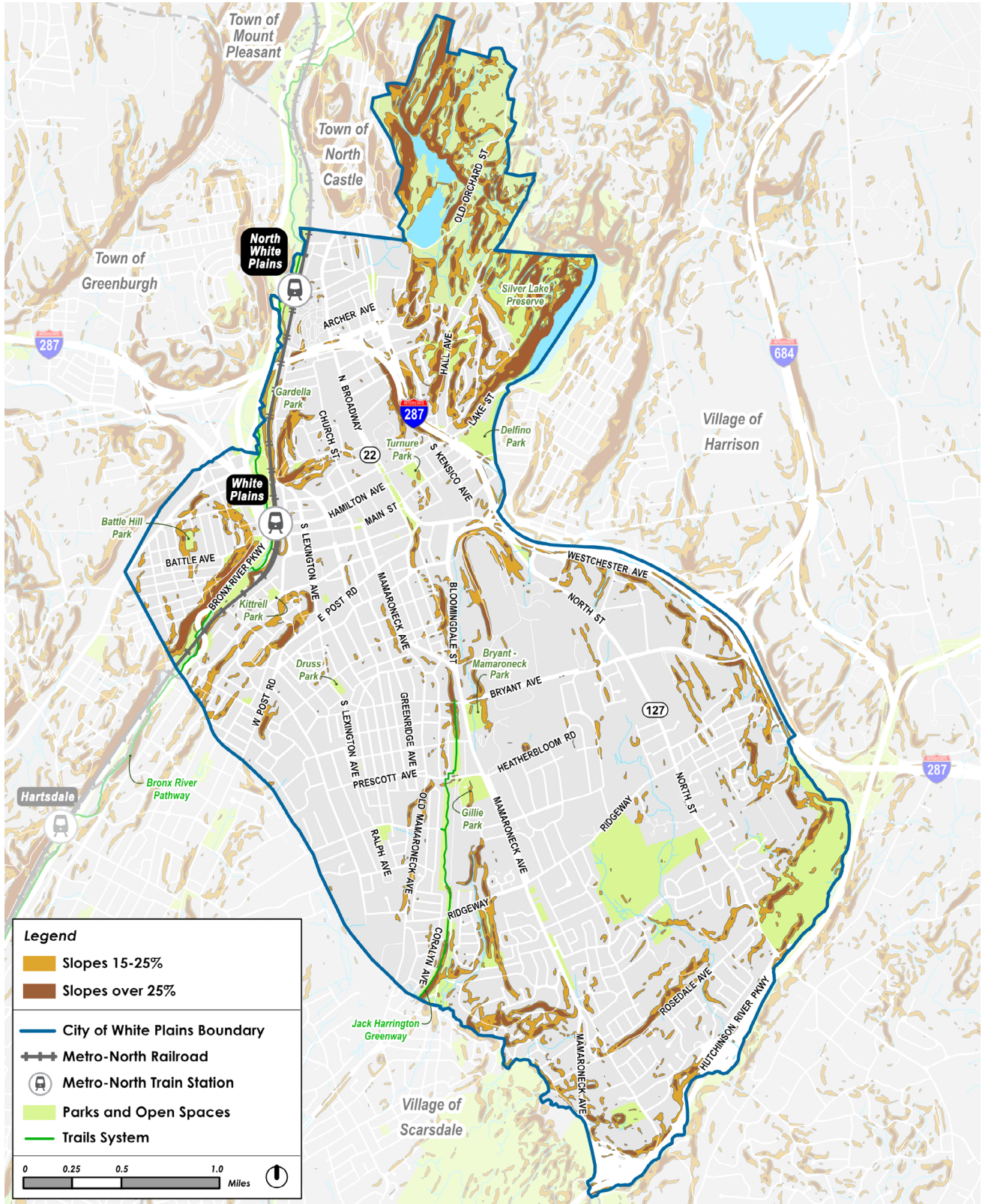
Rock Outcroppings

A rock outcropping is defined as an area of exposed rock, any portion of which lies two feet or more above the surrounding grade. Rock outcroppings contribute to the natural character of a site and provide habitat suitable for certain flora and fauna. The removal of rock has potential to impact offsite properties through vibration of bedrock and changes to water flows.



Figure 4: Slopes and Steep Slopes

Sources: City of White Plains, Westchester County, BFI Planning



TOPIC #2: CLEAN ENERGY

The common thread between sustainability and climate mitigation is the focus on how our actions today will impact the world tomorrow. This idea is also reflected in the United Nations’ concept of sustainable development, which is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 2021). The City of White Plains has established itself as a leader in implementing policies and programs to advance principles of sustainability, and climate change mitigation. The City believes that our existing programs that promote sustainability are not an endpoint, but rather a foundation for future innovation.

CLEAN ENERGY

Continue efforts to transition the local energy economy toward more renewable sources.

Clean energy is energy that comes from renewable, zero emission sources that do not pollute the atmosphere when used, as well as energy saved by energy efficiency measures. The City of White Plains has taken two major strides toward shifting to clean energy in recent years, for both the public and private sectors. First, by implementing the award-winning community solar program, and second, by adopting the New York State Unified Solar Permit. The City should continue pursuing strategies to provide additional renewable energy generating capacity on public land, while also encouraging private property owners to install renewable energy sources.



EXISTING CONDITIONS

White Plains has established itself as a local and regional leader in developing renewable energy projects. Several recent initiatives include:

Sustainable White Plains Committee – The Sustainable White Plains Committee was established in 2014 to advise the Mayor on responsible, realistic, and cost-effective measures for reducing the environmental impact of White Plains residents, businesses, and city government operations. Successful initiatives led by the committee include removal of invasive species and the Plastic Free White Plains program. Plastic Free White Plains was launched as a voluntary program, allowing restaurants and businesses to opt in. The success of Plastic Free White Plains helped to demonstrate the feasibility the ensuing mandatory program statewide.

Unified Solar Permit – White Plains became a registered Climate Smart Community (CSC) and adopted the New York State Unified Solar Permit in 2014.

The Unified Solar Permit provides a streamlined solar approval process, reducing barriers for private property owners to install solar by combining the building and electrical permits into a single application and by expediting the review process. In 2017, the City was Designated a NYSERDA Clean Energy Community and in 2023, achieved Bronze Certification in the Climate Smart Community Program.

Residents and business owners who are interested in installing solar panels can find out more information about the Unified Solar Permit on the [City of White Plains website](#)



White Plains Community Solar Project

Sanitation Building



Source: DSD Renewables
Source: Ramboll

Chester-Maple Garage



Source: DSD Renewables

Gedney Way Recycling Facility



Source: solarpowerworldonline.com

Table 1: White Plains Community Solar Project Locations

Name of Facility	Solar Size (DC)	Type of Structure/System
Longview Garage	469 kW	Rooftop Canopy
Lyon Place Garage	423 kW	Rooftop Canopy
Sanitation Building	605 kW	Flush Mount (Roof)
Gillie Park Lot	325 kW	Rooftop Canopy
Gedney Way Recycling Center	1270 kW	Ground Mount (Landfill)
Chester-Maple Garage	832 kW	Rooftop Canopy
Ebersole Ice Rink Roof	331 kW	Flush Mounted (Roof)
Shapham Place Garage	1164 kW	Rooftop Canopy

White Plains Community Solar Project - The White Plains Community Solar Project began in 2020 with the installation of solar panels at eight (8) City facilities. The installations are expected to generate 8,100 megawatt hours (MWh) of energy per year. To reduce capital cost, the City partnered with DSD Renewables, which owns and maintains the system. As the host property owner, the City of White Plains receives renewable energy and revenue generated from the system. The total annual revenue was estimated to be approximately \$960,000, or \$25 million over the life of the agreement and will generate enough solar energy to power more than 700 homes. The installation was completed in 2022.

Solar Energy Zoning Regulations - In August 2022, the City adopted a comprehensive zoning amendment to permit and regulate solar energy systems. The new zoning

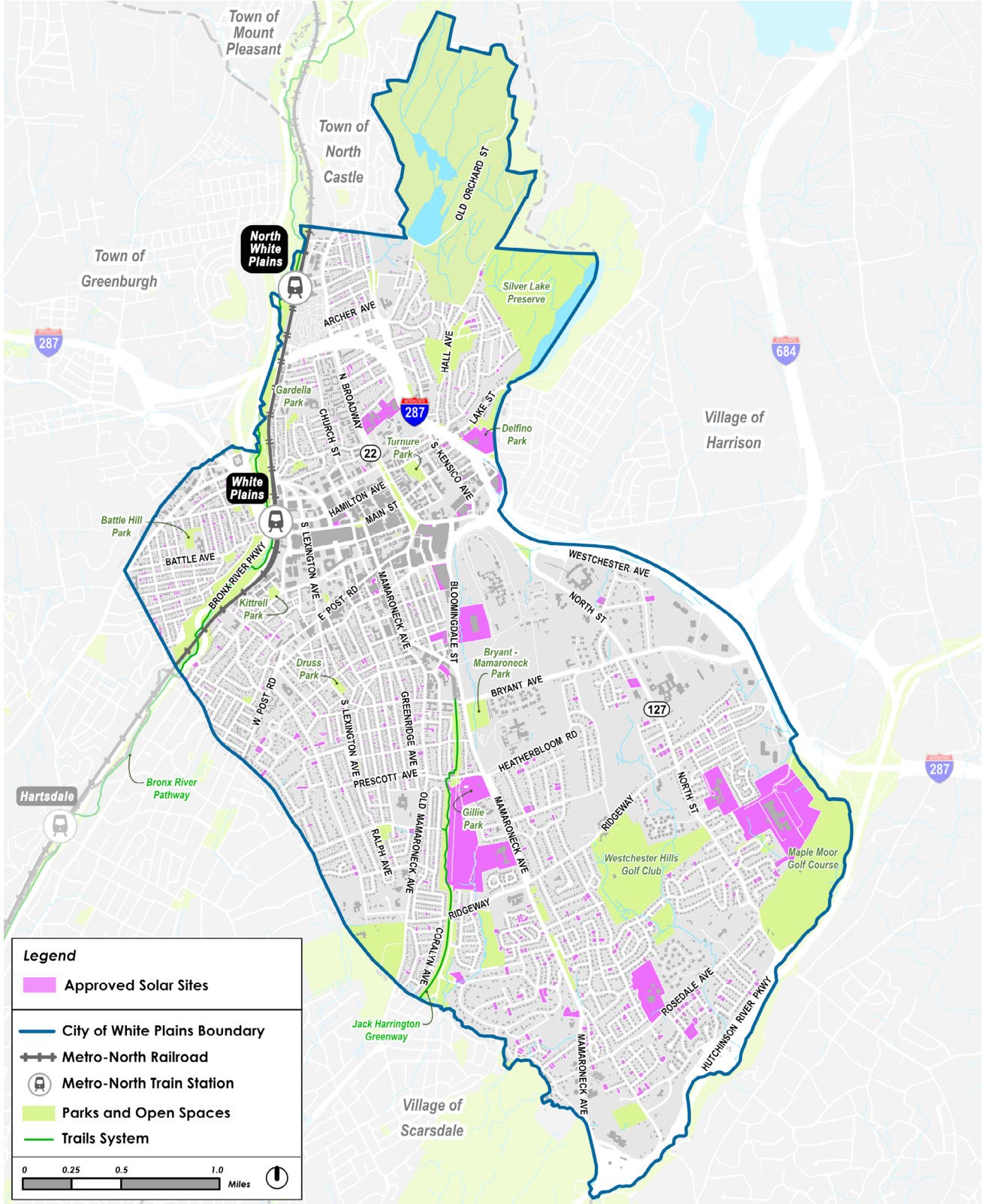
permits the installation of flush mounted solar energy systems on all buildings and regulates solar canopies in parking lots to address community concerns regarding safety and visual impacts by requiring landscaping and screening plans, inspection of plantings after installation, dimensional standards, and a decommissioning plan. The law has become a model state-wide to provide regulatory guidance for suburban and small/medium urban communities alike.

Other Clean Energy Measures

- Replacement of all street lights throughout the City with LED lights (completed in 2017); and
- Replacement of all lighting in City buildings, parking garages and athletic facilities with LED lights.

Figure 5: Solar Projects in White Plains

Sources: City of White Plains, Westchester County, BfJ Planning



TOPIC #3: DECARBONIZATION

Decarbonization is defined as the removal or reduction of carbon dioxide and other greenhouse gas (GHG) outputs into the atmosphere. Decarbonization can occur through transportation investments (by encouraging electric vehicles, non-motorized transit and greater public transportation use), at a building site (by electrifying buildings instead of using oil or gas) and at power generation sources (by shifting to renewable energy instead of burning coal or natural gas).

Transportation, particularly the burning of fossil fuels to power personal vehicles, is a top contributor of greenhouse gas emissions. While *connectWP* provides an account of the City’s multi-modal transportation network, *greenWP* reinforces the importance for the City to create policies and infrastructure that promotes public transportation and active transportation. Such efforts promote sustainability by reducing car trips and total vehicle miles traveled -- ultimately reducing GHG emissions. Refer to *connectWP* for a package of initiatives that encourage White Plains to be a more walkable, bikeable, and public-transit friendly City.

Greenhouse gas emissions associated with residential and commercial buildings also make up a substantial proportion of GHG emissions. While improvements in energy efficiency of buildings is a critical step in reducing GHG emissions, full decarbonization of the building sector is a long-term goal.

By shifting buildings away from combustion of fossil fuels, White Plains can reduce its contribution to climate change while also having a beneficial impact on air quality.

White Plains has already taken on initiatives in the past to reduce energy consumption by the building sector. These past and current initiatives are a strong foundation. The next step for White Plains as a regional leader is to move from reducing energy consumption to decarbonization.

DECARBONIZATION

Pursue strategies by the public and private sectors to reduce greenhouse gas emissions and pursue decarbonization of the local economy.

EXISTING MEASURES

New York State Climate Act (2019) - New York State signed the Climate Leadership and Community Protection Act (Climate Act) into law in 2019. The goal of this act is to reduce State-wide emissions across sectors: 40% by



Electric Vehicle (EV) Chargers at the Lyon Place Municipal Garage and Main-Hamilton Garage

Table 1: Public Electric Vehicle Charging Stations in White Plains in 2022

Name of Facility	Address	Number of Chargers
Lexington-Grove East Garage	100 Main Street	3
Lexington-Grove West Garage	100 Main Street	2
Hamilton-Main Garage	365 Hamilton Avenue	3
Longview- Cromwell Garage	11 Longview Ave	2
Lyon Place Garage	5 Lyon Place	2
Shapham Place Parking Lot	17 Shapham Place	2
Chester-Maple Garage	9 Chester Avenue	3
Library Garage	100 Martine Avenue	3
TransCenter Garage	11 Ferris Avenue	8

Local Initiatives - In addition to the existing measures discussed in the previous topic, the City has implemented the following initiatives to reduce GHG emissions:

- Electric Vehicle Charging Stations - The City currently offers 28 publicly accessible electric vehicle charging stations, located in municipal parking structures and surface lots throughout the City.
- Transition of the City’s fleet of vehicles to low or zero emissions vehicles. As of fall of 2022, the City has a total of 347 vehicles. Of these, 3% are electric vehicles, 7% are hybrid (electric/gas) vehicles, and 12% run on another source of clean energy. Because of the City’s policy of replacing assets with low or zero emissions vehicles, these percentages are trending upward.
- Replacement of assets at the end of their life cycle with low or zero emissions vehicles;
- Installation of five miles of bike lanes, shared bike routes, and the first fully protected bike lane in Westchester County on Martine Avenue from Court Street to South Lexington Avenue;
- Reintroduction of a local electric-assisted bike share program;
- Requirement of LEED certification standards for Site Plan Approval and reduced building permit fees for projects that demonstrate LEED certification standards;
- Requirement of green building practices for Site Plan Approval, such as bicycle storage and open space



Source: Tania Savayan/The Journal News

TOPIC #4: CLIMATE RESILIENCE AND ADAPTATION

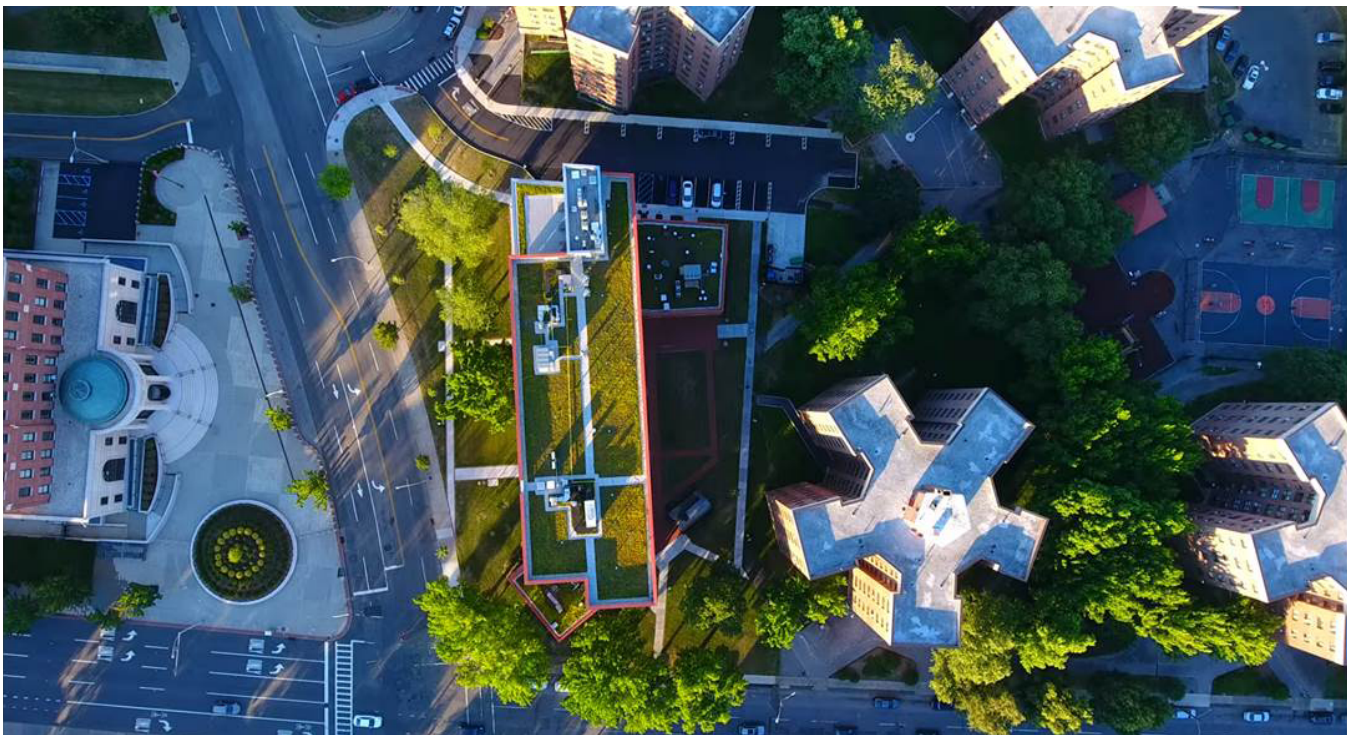
Climate resilience and adaptation describes the ability to prepare for, recover from and adapt and react to extreme weather or hazardous events. Oftentimes, the most discussed impacts of climate change are limited to sea level rise caused by global warming. However, as an inland community, there are several other climate hazards that are projected to impact the City of White Plains in the coming years. Some of these hazards have already been measured in the mid-Hudson region, including extreme precipitation and extreme temperatures.

Many climate-related impacts have already been observed in New York State over recent decades. These impacts are projected to worsen and become more frequent as a result of climate change. Therefore, even though it is critically important for cities like White Plains to continue to show leadership in implementing strategies to mitigate climate change, it is just as important for the City to begin adapting to the impacts that we are already experiencing—and are projected to experience in even greater degrees in the coming years.

CLIMATE RESILIENCE AND ADAPTATION

Improve climate resilience by increasing the City's ability to anticipate, prepare for, and respond to hazardous events, trends, and other impacts of climate change.

As important as it is for cities like White Plains to continue to lead on efforts to reduce our contribution to climate change via mitigation strategies, we also have to recognize that we are already experiencing the impacts of a new climate reality. Climate adaptation refers to our efforts to prepare for this new reality by making the City more resilient to extreme weather events, such as heavy rains and extreme heat. We know that these climate hazards have already started to become more frequent and will continue to get more extreme and more frequent in the coming decades. By focusing on climate adaptation, White Plains seeks to protect residents from current and future climate hazards.



Aerial View of White Plains

INITIATIVES

TOPIC #1: ENVIRONMENT, NATURAL RESOURCES AND OPEN SPACE

greenWP 1

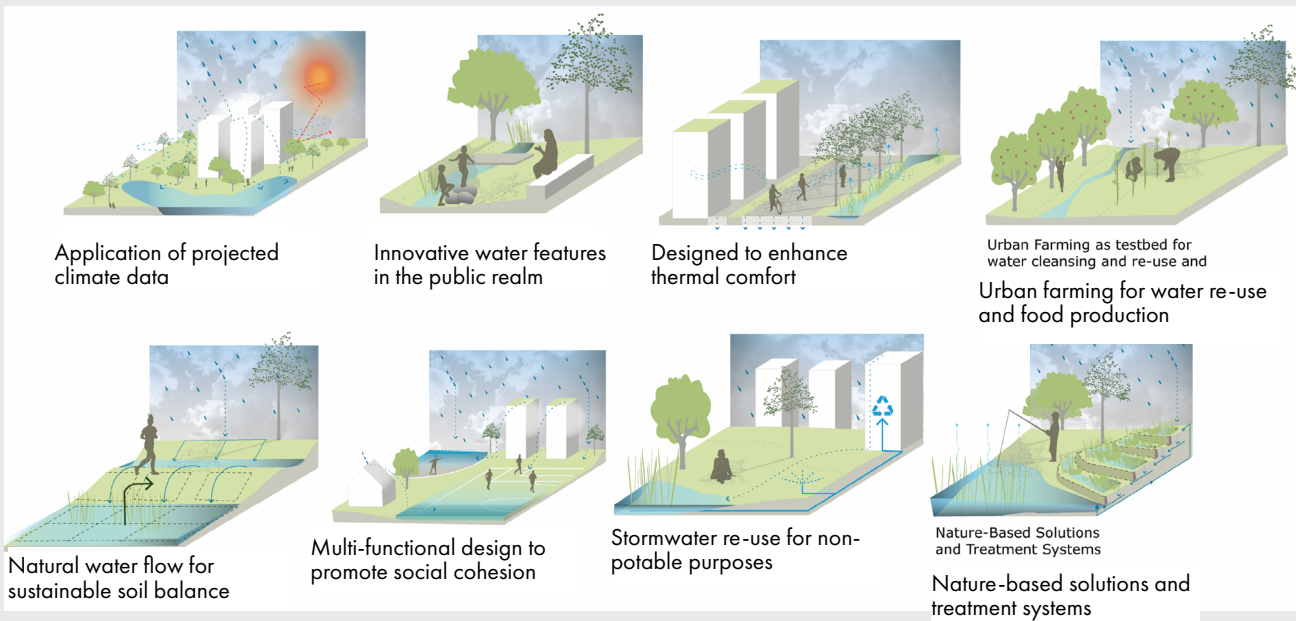
Conduct an Open Space and Natural Resources Inventory.

The City last conducted a comprehensive Open Space Inventory in 1992. Although much of the detail documented in this inventory remains relevant for certain properties, changes to both public and private open space lands should be reflected in this update in order to steer future planning efforts. An updated inventory would refine policies to enhance the City’s open space resources – both to protect the natural environment and set a course to improve public access and passive recreation.

With an emphasis on documenting existing natural resource functions and ecosystem services in the City’s natural open spaces, this effort should also identify and prioritize natural and nature-based solutions for resilience.

The value and role of natural resources in achieving resilience to climate change cannot be underestimated, as these features often adapt to changing conditions with limited or no human intervention. The inherent resiliency of natural systems to changing environmental conditions can also be leveraged for specific needs or purposes. For example, wetlands provide critical buffers between floodplains and development. Protecting and restoring these resource functions will not only result in a greater level of resilience, but will also provide multiple ecological benefits (wildlife habitat, aesthetics, indirect economic benefits).

Nature-Based Solutions for Stormwater Management



Application of projected climate data

Innovative water features in the public realm

Designed to enhance thermal comfort

Urban Farming as testbed for water cleansing and re-use and food production

Urban farming for water re-use and food production

Natural water flow for sustainable soil balance

Multi-functional design to promote social cohesion

Stormwater re-use for non-potable purposes

Nature-Based Solutions and Treatment Systems

Nature-based solutions and treatment systems

Source: Ramboll

greenWP 2

Update regulations pertaining to environmentally sensitive sites or features to ensure that new development does not compromise the natural environment.

Opportunities for such regulatory updates include:

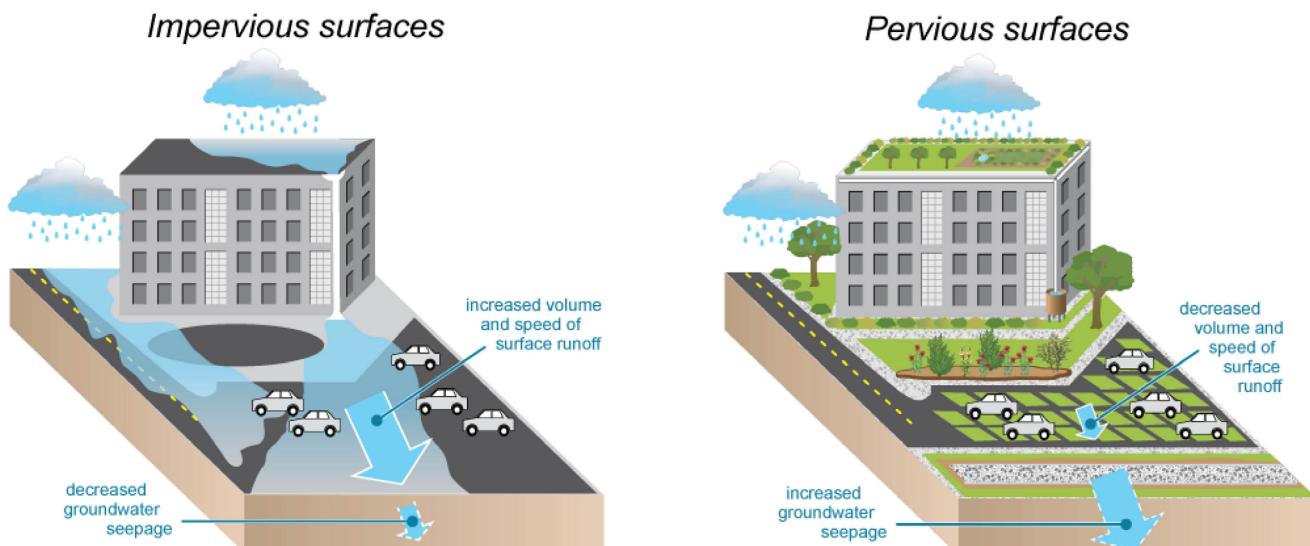
- Section 4.4.25 “Environmentally Sensitive Sites or Features” of the Zoning Ordinance and Section 3-5-1 of the White Plains Municipal Code should be amended to better protect and/or restore wetlands that provide critical buffers between areas that are prone to flooding and development.
- Expand Planning Board site plan approval authority to reduce footprint, coverage, or increase wetland buffers to reduce potential development impacts on environmentally sensitive sites and flood-prone areas.
- Consider refining the City’s Flood Damage Prevention Code (Chapter 7-10 of the Municipal Code) to discourage development within regulated floodplains and areas prone to localized flooding.
- For multi-parcel development sites, consider a density transfer mechanism to locate development away from flood-prone and/or other environmentally sensitive areas. Such a mechanism could incentivize non-developed buffer areas by shifting development density to other site parcels.

greenWP 3

Establish an impervious surface definition in the Zoning Ordinance and develop regulations that limit coverage of a site to improve stormwater runoff and increase green space.

Impervious surfaces are areas where water cannot penetrate the ground surface (i.e. parking lots, buildings, and other paved areas), leading rainwater to flow over these surfaces directly into catch basins, streams, and wetlands. Permeable pavements, however, infiltrate, treat, and/or store rainwater where it falls. Generally, high concentrations of impervious surfaces can exacerbate flooding conditions when stormwater infrastructure is not adequate.

By defining impervious surfaces in the Zoning Ordinance, the City can then develop regulations that limit coverage of a site to improve stormwater runoff and increase greenspace. This definition would help to support the City’s current Zoning Ordinance definition of “gross land coverage.” To assist with the feasibility of larger projects with paved surfaces, the City could consider incentives for projects that use permeable pavements which are considered to be a green infrastructure alternative to traditional impervious surfaces.



Source: Jane Hawkey, Integration and Application Network

greenWP 4

Continue to monitor water quality of local lakes and streams in conjunction with County and State agencies.

Establish jurisdictional standards and identify funding sources to maintain and enhance local water quality. The character and function of the City's watercourses could be further detailed during the process to update the open space and natural resource inventory (greenWP 1).

Another key component of maintaining and improving local water quality and related habitats is to coordinate with local communities. The City of White Plains could be a leader in convening Westchester County communities to discuss and coordinate local improvements.

greenWP 5

Strive to increase biodiversity by maintaining and enhancing the City's tree canopy.

Continue working with developers and property owners to plant native plants and pollinator habitats as landscaping with new and existing development.

greenWP 6

Assess opportunities to improve natural open spaces with a focus on expanding public access and enhancing connectivity.

- Enhance convenient public access to natural open spaces through adequate sidewalks and, when feasible, bike lanes and public transportation. The City could strive to improve walking and biking connections to natural open spaces.
- Expand public access to open spaces and provide additional trails in natural areas. There is public interest for enhanced public access to the City's water supply lands in the north end of White Plains. Although this land currently prioritizes the safety and function of the City's reservoirs, the City could evaluate feasibility of providing public access points that allow residents to enjoy this reserve of natural open space through passive recreation (i.e. walking/jogging trails).
- Establish connections between existing open spaces and trails via acquisition, easements, etc.

This initiative was included in the previous comprehensive plan which detailed the opportunity to develop a more extensive Mamaroneck Avenue open space system that encompasses a trail through buffer areas protected by easement restrictions with Burke Rehabilitation Center and New York Hospital. Additional open space network opportunities should continue to be explored as well, including the previous Open Space Acquisition Advisory Committee's recommendation to *further a trailway loop north of Downtown and a loop that would better connect Bryant Avenue to southern White Plains.*

- Establish public access and buffer maintenance protocols as part of site plan approvals in areas targeted for publicly accessible open space improvements. Buffer maintenance protocols can help reinforce the health of the environment as well as to ensure overall upkeep.

greenWP 7

Revise tree preservation guidelines to include a tree removal permitting process for trees on private property.

The preservation of trees can help protect the local environment and community health. A codified permit process for the removal of trees on private property or rights-of-way would support the preservation and longevity of this natural resource. The permit could detail specific standards – for example, a required permit could cover the removal of a single large tree that meets a specific size threshold or the removal of more than a certain number of trees of any size within a 12-month period on the same property.



Green Infrastructure at the White Plains Public Library

TOPIC #2: CLEAN ENERGY

greenWP 8

Establish Sustainable Development Guidelines to be incorporated into the site plan approval process.

Sustainable Development Guidelines can identify specific sustainability measures to be considered in all new buildings, where appropriate.

Components of the Sustainable Development Guidelines could include:

- LEED Certification (or equivalent)
- Clean energy (e.g., solar panels, geothermal)
- Green Roofs
- Retrofitting of existing buildings
- Stormwater recapture and reuse on-site
- Low-sulfur fueled vehicles in building construction
- Water quality and quantity control technologies
- Environmentally preferable building materials and specifications
- Wastewater reduction and recycling
- Clean air and healthy indoor environment standards
- Reduction of impervious surfaces (see greenWP 3).
- Use of the City's "Complete Streets" policy as a baseline standard for larger projects that involve streetscape redesign – i.e. adequate sidewalks that are contextually designed; bike infrastructure such as bike lanes when feasible; enhanced bus shelters.

greenWP 9

Encourage the installation of solar on private buildings and parking lots consistent with the City's existing solar energy system regulations.

- Investigate feasibility of a pilot community solar program to link small downtown commercial rooftops as a means to establish economically viable rooftop solar systems. Such a community commercial solar program could also consider the inclusion of contiguous or neighboring apartment buildings.
- Identify potential federal, state and local funding sources to further incentivize installation of solar energy systems on private property.

greenWP 10

Evaluate opportunities to expand municipal renewable energy projects.

- Establish clean energy targets to create a roadmap to 100% clean energy.
- Explore opportunities to expand the City's community solar program with small-scale installations on publicly owned land and buildings.



greenWP 11

Consider adoption of specific Battery Energy Storage System regulations.

The New York State Climate Act set statewide technology-specific goals to meet the State's greenhouse gas reduction goals. The State set a target of 1,500 MW of battery energy storage by 2025 and 3,000 MW by 2030. New York State defines Battery Energy Storage Systems as one or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time. Solar power is one common energy source for battery energy storage systems. Battery energy storage systems are devices that enable energy from renewables, like solar and wind, to be stored and then released when customers need power most. Energy storage helps to integrate clean energy into the grid, reduce costs associated with meeting peak electric demands, and increase efficiency. Additionally, energy storage can be used to stabilize supply during peak electric usage and help keep critical systems online during an outage.

Battery energy storage systems are broken down into two classes:

- Tier 1 BESS: Pertains to storage systems for individual homes or smaller buildings and can be generally permitted in all zoning districts and exempt from site plan review
- Tier 2 BESS: Larger scale commercial or utility storage systems that hold a greater power reserve and merit greater regulation, i.e. more stringent site plan application requirements.

The New York State Energy Research and Development Authority (NYSERDA) has developed a model law intended to help communities adopt clean energy-supporting regulations to safely accommodate battery energy storage systems. The model law lays out procedural frameworks and substantive requirements for residential, commercial, and utility-scale battery energy storage systems. In addition to a regulatory framework that guides BESS location, construction and operation, the law also seeks to mitigate for potential BESS impacts on environmental resources and ensures compatible land uses in the vicinity of BESS locations.

greenWP 12

Ensure that clean energy projects are equitable and advance inclusivity by creating local jobs and economic benefits.

The City should take measures to ensure that the environmental and economic benefits of clean energy projects are inclusive and positively impact underrepresented populations. Measures that the City can take to ensure equitable implementation of clean energy projects could include:

- Encourage local hiring for clean energy projects to boost the local economy. Work with installers and surrounding communities to create a regional workforce training program.
- Encourage renewable energy and clean energy projects in areas with socially vulnerable populations and ensure that economic benefits are passed on from property owners to tenants.
- Partner with White Plains Public Schools to promote educational programs about environmental and climate stewardship.



Battery System Paired with Residential Rooftop Solar

Source: US Office of Energy Efficiency and Renewable Energy

greenWP 13

Further define the role and mission of the Sustainable White Plains Committee.

- Creation of a centralized website to educate the community and provide resources for sustainability measures that residents can implement at their homes and businesses.
- Common Council adoption of an updated Sustainability Policy to outline priorities for the Committee to pursue.
- Providing an annual update on the City’s progress in achieving sustainability goals, including implementation of greenWP and other City-wide sustainability initiatives.
- Ongoing community engagement to understand priorities for the future, including inclusive outreach to underrepresented populations in the community.
- Regular outreach to neighborhood associations.
- Leveraging signage and local media to promote new pilot programs established in the City.

greenWP 14

Formalize a Director of Sustainability position to lead future City actions related to sustainability and climate change mitigation and adaptation.

The issues contained within greenWP are critical to the future of White Plains and our role in both reducing contributions to climate change and adapting to climate impacts. These challenges merit a dedicated full-time position within local government to lead these efforts, ensure that the Initiatives in greenWP are implemented, and continue to evolve our sustainability goals in the future. The Director of Sustainability would serve as an interdepartmental liaison within the City and also lead the Sustainability Committee. In coordination with other City leaders, such a role would also work to ensure that Initiative implementation maximizes benefits for low socioeconomic communities and communities of color. Additionally, a Director of Sustainability could play a critical role in applying for relevant grants and manage public outreach efforts to support the City’s sustainability efforts (see strategies listed in greenWP 13).



Bloomingdales Rooftop Solar System in White Plains, Source: Solar Landscape

TOPIC #3: DECARBONIZATION

greenWP 15

Produce a Climate Action Plan (CAP) that identifies future greenhouse gas emissions and decarbonization goals.

A keystone action for the CAP could be to develop greenhouse gas (GHG) emissions inventory for both government operations and community uses such as businesses, homes and transportation. Such an inventory would be utilized to establish GHG emissions reduction strategies and supporting actions with quantified emissions reductions impacts, prioritized by cost-effectiveness and community benefits.

The White Plains Climate Action Plan (CAP) could inventory current greenhouse gas (GHG) emissions, establish GHG reduction targets, and detail actions to meet those targets. The White Plains CAP may also include additional components such as adaptation and resilience strategies, clean energy targets, economic development related to sustainability goals, and equity goals. The CAP could include recommended strategic initiatives to convert businesses and residences from fossil fuel to electrification, with consideration for available energy supply, technology, and financial incentives to support individuals and families of all income levels.

The White Plains CAP would benchmark current GHG emissions, set ambitious but achievable reductions targets, and outline data-driven strategies for clean energy, building decarbonization, mobility and land use, waste and recycling, water quality, governance and transparency, and equity and social justice. The CAP would also include a summary of existing renewable energy installations (public and private) and an inventory of existing buildings with a green building certification (e.g., LEED).



greenWP 16

Further enhance the energy efficiency of municipal buildings and incentivize private building owners to do the same.

Efforts to achieve this in municipal buildings could include:

- Track data on municipal energy use and conduct energy audits of City-owned buildings to identify low-cost, high-reward actions that will repay their investment in the short term.
- Identify grant sources and funding streams to implement energy efficiency projects.
- Create a program to educate City employees on how to be more energy efficient in the workplace.
- Establish policies to ensure that City agencies and departments work to implement energy efficiency initiatives.
- Continue to expand on Westchester County initiated strategies to implement energy reduction measures in municipal buildings. To encourage transit sustainability for municipal building workers and visitors, secure bike parking could be provided on site.

Establish a web-based resource to connect property owners with technical assistance programs and financial incentives to improve energy efficiency. Coordinate with local and regional organizations (e.g., ConEd, Sustainable Westchester, NYSERDA, etc.) to provide information about resources, benefits, and energy cost savings of implementing energy efficiency retrofits in existing buildings. Update the City's Community Development Block Grant (CDBG) guidelines to permit energy efficient upgrades.

- Educate commercial property owners about [Property Assessed Clean Energy \(PACE\) Financing](#). The New York Energy Improvement Corporation operates this program to provide low-cost financing for commercial property owners to implement energy efficiency upgrades and renewable energy projects. The City of White Plains is a municipal member of the Energy Improvement Corporation, which makes this financing available to property owners within the City.

- Educate property owners and renters of single-family homes and small multi-family buildings about New York State incentive programs for energy efficiency. NYSERDA offers free energy audits, discounts on energy efficient equipment, and low interest financing to invest in energy efficiency measures. Programs include Residential Energy Audit, Residential Financing, Assisted Home Performance with ENERGY STAR, and EmPower New York.

Residents can view a database of NYSERDA’s Home Energy Efficiency Programs, along with eligibility requirements, by clicking [here](#).

New York City has legislation and related programs that require benchmarking of existing buildings’ energy efficiency: [Benchmarking and Energy Efficiency Rating - Buildings \(nyc.gov\)](#)

The local law defines which buildings have to comply (i.e., buildings over 25,000 square feet, with some exceptions), and requires building owners to use the EPA online benchmarking tool ([Energy Star Portfolio Manager](#)).

NYSERDA offers a [Benchmarking Toolkit](#) resource that could support such legislation in White Plains.

- Consider benchmarking of existing buildings to measure energy efficiency compared to similar building types. Benchmarking data could be made publicly available so that tenants can make market-based decisions and property owners can better understand their buildings’ energy use so they can take measures to improve performance.
- Pursue ‘rebate stacking’ programs to provide additional incentives on top of utility-sponsored incentives. Examples of these programs are Energy Audit “buy-down” programs where the City funds energy audits through an existing utility energy audit program and/or Business Energy Efficiency Project Implementation Support to facilitate businesses that elect to perform an ASHRAE audit or undertake an efficiency project.

greenWP 17

Enact policies that require new buildings to operate at net zero carbon by a year certain.

The City of White Plains could join a national or international commitment to achieving building decarbonization on a timeframe that is both ambitious and achievable. Programs such as the [C40 Cities Net Zero Carbon Buildings Accelerator](#) and the [U.S. Department of Energy Better Climate Challenge](#) provide a framework for municipalities to reduce GHG emissions over time.

greenWP 18

Encourage developers to substitute conventional building materials (concrete, steel, aluminum) with bio-based materials (such as mass timber) to reduce their carbon footprint.

greenWP 19

Continue to invest in electric vehicle charging station infrastructure and require EV charging stations in all public and private parking lots and structures.

Although a key measure of achieving a more sustainable local transportation system is to reduce car dependency and personal vehicle trips through increased public transit use and adequate alternative transit infrastructure (sidewalks, bike lanes), it is also critical that the City is equipped to support electric vehicle (EV) demand and related needs, especially as rates are expected to increase.

Policies and programs that the City could pursue include:

- Require parking lots with 25 or more spaces to include level 2 EV Chargers. Establish a percentage of parking spaces that must be EV compatible and require a percentage of spaces to be EV ready with a pre-run conduit and an electrical panel that can be sized to incorporate additional chargers in the future. Charge a fee, but set the kilowatt per hour rate lower than the cost for residential electricity to encourage use and offset the cost.

- Conduct outreach to large commercial building owners to install EV charging stations for employees. Consider incentives for property owners that allow residents to use these charging stations overnight.
- Conduct a feasibility study for providing curbside charging for residents who do not have access to off-street parking to charge EVs. Such a program could especially benefit low/moderate income residents who live in multi-family buildings with limited off-street parking, making access to EVs more equitable.
- Explore partnering with an EV charging station contractor to install charging stations in surface lots and garages. Using the Community Solar Project as a model, the City could lease public land to the contractor, who would install charging facilities that operate similar to a gas station. This program could also include partnership with private property owners, who also partner with the contractor to install charging stations.
- Conduct outreach to co-ops, condos and rental buildings to understand EV access challenges and strategize scalable solutions. Such outreach would recognize buildings' different renter/owner compositions and parking constraints which present unique challenges to acquiring on-site EV charging stations. While strategies could consider on-site solutions, the City can also consider siting EV charging stations in close proximity to buildings with demonstrated need.

Electric Vehicle (EV) Battery Recycling

It is recognized that EV technologies are evolving with the potential to become increasingly sustainable and efficient.

However, the question of EV battery recycling is an important sustainability concern as production increases to match global demand – especially regarding the re-use of battery metals (i.e. cobalt, lithium, nickel).

As EV vehicle technologies advance it is also expected that battery recycling/re-use facilities will become more prevalent.

The City of White Plains could coordinate with the County and other regional municipalities to strategize new recycling facilities and steer policies that encourage recycling end-of-life batteries.

Case Study

City of Seattle

Seattle City Light is installing and operating public Level 2 electric vehicle (EV) chargers at curbside locations throughout the City of Seattle. City Light is offering this service to provide near-home EV charging for residents who cannot access off-street parking to charge their vehicles.



Source: Seattle City Light

Case Study

Sacramento

In 2019 the City of Sacramento opened [curbside fast charging stations](#) in partnership with a private vendor.



Source: City of Sacramento

greenWP 20

Study the feasibility of prohibiting new natural gas and fuel oil hookups in new residential and commercial buildings.

Banning natural gas is a key step in achieving decarbonization of the building sector. The current moratorium from ConEdison on natural gas hookups in new construction has demonstrated the feasibility of the development community adapting to such a requirement. Building electrification would expedite a shift to efficient air source and ground source heat pump technology, which also provides more efficient cooling during the hot summer months. Natural gas bans are becoming more common throughout the U.S., including in New York City and Ithaca.

Case Study

In 2022 the City of Ithaca, NY launched a first of its kind [building electrification program](#) that aims to electrify the City's entire building stock by 2023.

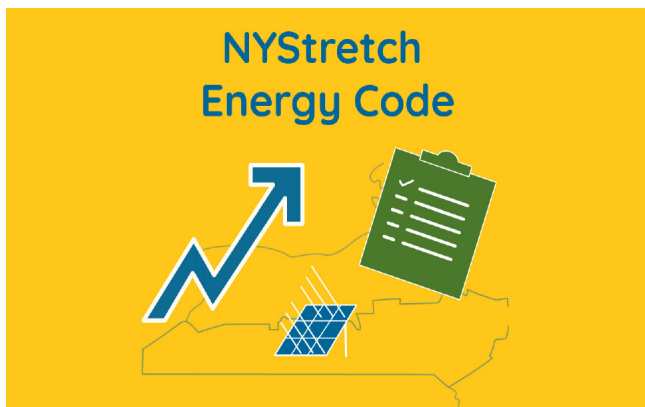


Source: City of Ithaca

greenWP 21

Adopt the NYStretch Energy Code.

The NYStretch Energy Code is a supplement to the New York State Energy Code. It was developed by NYSERDA and is available to local governments for voluntary adoption as a more stringent local energy code. NYStretch improves the State Energy Code efficacy by about 10%. It is a model for local jurisdictions to meet their energy and climate goals. Because NYStretch is a statewide program and is coordinated with the New York State Uniform and Energy Codes, it is familiar to local building departments and developers.

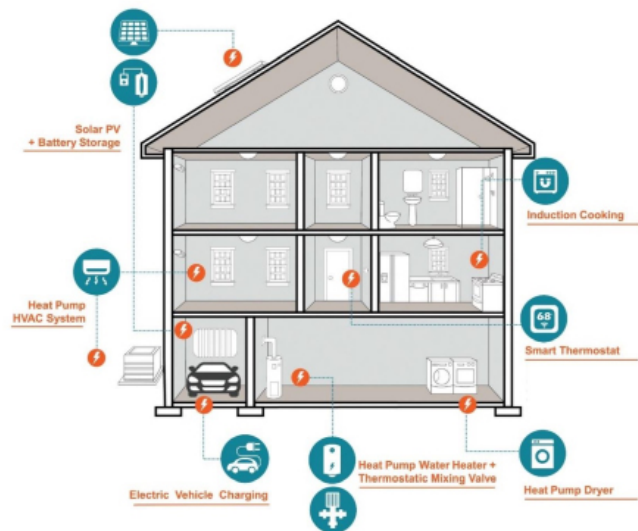


Source: NYSERDA

greenWP 22

Pursue a Comprehensive Building Electrification pilot program for existing buildings through a public-private financing partnership.

The program would support the City's efforts to fully decarbonize by extracting emissions reductions potential from existing building stock. GIS analysis and inventory of the existing building stock can be used to determine the total number of eligible buildings for retrofits. Aggregate the eligible buildings into blocks of buildings or zones to create discrete projects and securitize the project to attract private capital. Identify a private equity financing partner, Federal and State funds, and a retrofit/electrification contractor or program administrator, to work with the City to administer, fund, and implement the program. The program partners (private equity and contractor) would raise/contribute capital to make low-interest loans for heat pumps and other electrification technologies to be installed in residences and businesses in the aggregated blocks/zones.



Building Electrification Considerations; Source: BuildingGreen

TOPIC #4: CLIMATE RESILIENCE AND ADAPTATION

greenWP 23

Conduct a comprehensive climate resilience and adaptation planning process to identify future climate impacts and initiatives to achieve resilience.

The components of the climate resilience and adaptation planning process (Climate Risk Assessment, Climate Adaptation Plan, and Blue-Green Infrastructure Plan) could be done in a single, unified study, or they could be completed in sequence as individual studies. While these components can be conducted City-wide, neighborhood level analysis could be explored, particularly in an effort to target interventions in communities that are prone to greater risks and vulnerabilities.

The climate resilience and adaptation planning process should factor in future climate conditions and innovative climate adaptation strategies. Components of the study could include:

Climate Risk/Vulnerability Assessment

A Climate Risk Assessment could identify the likelihood of future climate hazards and potential impacts on White Plains. This study would examine citywide vulnerabilities that affect government services, functions, and systems, as well as impacts on private property. Vulnerabilities are also linked to interdependencies between sectors (i.e., water, energy, and transportation). These interdependencies are more evident during extreme weather events, causing a cascade of failures (e.g., a wind storm that causes downed power lines, leading to power outages at critical facilities, disrupting the ability of emergency response). The Climate Risk Assessment could use a systems approach to interdependencies, rather than looking at isolated sectorial impacts alone. The starting point in establishing the systems approach framework is a proper understanding and analysis of vulnerabilities. Environmental and climate risks modeled in this assessment could be made public in the form of maps on the City's website and GIS database.

The Climate Risk Assessment could include:

- Overview of demographics, socio-economic, and environmental context.
- Summary of past extreme weather events related to climate change.

- Climate change trends and future scenarios, summary of the likelihood, consequence, frequency, and impacts of climate hazards.
- Analysis of climate factors to project impacts of climate change on future climate hazards.
- Mapping of climate risks and vulnerabilities (i.e. flooding, heat island effects, etc.)
- Prioritization of risks based on exposure, sensitivity, and vulnerability.

Climate Adaptation Plan

The purpose of a Climate Adaptation Plan is to identify and prioritize the most effective actions to respond to climate hazards, including actions that have the best return on investment, synergy with other planning/capital projects, and flexibility in relation to changing projections for future climate. The Plan would build upon hazards identified in the Climate Risk Assessment (e.g., extreme weather, heavy rains, drought, extreme heat, etc.). Proposed adaptation actions would be based on analysis and modeling of projected impacts and prioritization of risks. A cost-benefit analysis would include costs for implementation, operation and maintenance, and reinvestment over time. Benefits include avoided risk and costs over time, as well as added value created through adaptation measures. Figure 6 illustrates the iterative process to ensure that the adaptation plan is meeting the goals and objectives established during the community engagement process. The Climate Adaptation Plan could follow a four-step process:

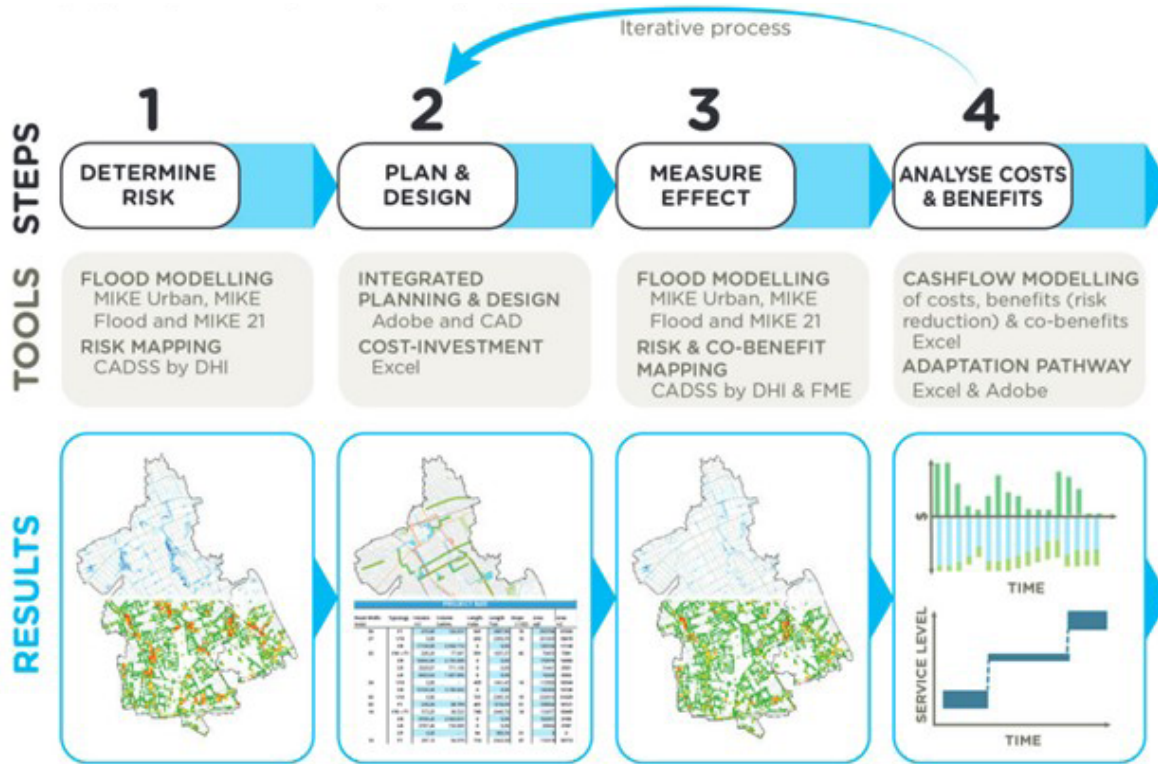
- Initial determination of risk
- Development of a resiliency plan
- Documentation of the benefits of adaptation projects
- Cost-Benefit Analysis



Green Infrastructure at the White Plains Public Library

Figure 6: Climate Adaptation Planning Process

Source: Ramboll



Blue-Green Infrastructure Masterplan

Blue-Green Infrastructure (BGI) connects urban hydrological functions (blue) with vegetation systems (green), using nature-based solutions to mitigate flooding from rain events. BGI can reduce the demand on traditional stormwater infrastructure, while also providing other benefits such as improved parks and open space, biodiversity and habitat, and cooling for urban comfort and reduced urban heat. A Blue-Green Infrastructure Masterplan could analyze expected flooding conditions and recommend strategies to minimize impacts. These strategies would be based on flood modeling, cost-benefit analysis, and maximization of co-benefits, such as enhancing community diversity, workforce opportunities, and neighborhood revitalization. A BGI Masterplan could also include site-specific designs for priority sites and typologies that can be applied throughout White Plains.

The objective of the plan is to develop designs that will serve multiple purposes to ensure that investment in stormwater solutions will benefit residents and businesses throughout the year, in addition to functioning as protective measures for extreme climate events.

Components of the BGI Masterplan could include:

- Analysis of Best Practices
- Flood Modeling to determine overland flows and analysis of the stormwater pipe system
- Determination of the risk level based on climate modeling
- BGI Typologies for streets, parks, and other sites
- BGI Network Plan and Conceptual Drawings
- Identification of co-benefits and added value
- Construction Phasing Strategy and Financing Plan
- Cost-Benefit Analysis
- Financing Plan

Refer to the Appendix (Figure A-1) for a graphic that demonstrates BGI components.

Blue-Green Infrastructure: Principles

Conveyance

Conveyance paths on terrain are designed to move water through the public realm.

Paths can vary from small, temporary streams to large channels, depending on necessary capacity.



Detention

Detention areas are urban spaces designed to reduce peak stormwater flow.

Detention areas can be permanent waterbodies or they can be usable public spaces that are designed for temporary storage during extreme rain events.



Source: Ramboll

Blue-Green Infrastructure: Hierarchy



Daily Events

Large Events

Extreme Events



Stormwater managed within development parcels through green roofs, permeable surfaces, and green infrastructure

Small scale interventions that are integrated in the urban landscape to convey and provide storage for large rain events

Controlled and temporary flooding of parks and open spaces during more extreme rain events

Source: Ramboll

Example of Blue-Green Infrastructure Design

Hans Tavsens Park Cloudburst Plan, Copenhagen, Denmark

Typical Conditions



Source: Ramboll

Capturing stormwater during a cloudburst event



greenWP 24

Address urban heat by creating a greener White Plains.

Conduct a Heat Vulnerability Assessment to target future actions. Actions to implement the Heat Vulnerability Assessment may include:

- Perform a microclimate analysis to understand urban thermal comfort and identify 'hot spot' areas for targeted cooling interventions.
- Develop a Heatwave Response Plan
- Build partnerships between the City, health and emergency departments, local media, community groups, Westchester County, and social service providers to develop and implement the response plan.
- Create a communications strategy with the public and businesses. Work with social services providers and businesses who employ vulnerable workers to raise awareness about heat risks and mitigation measures.
- Identify priority actions in a heat wave, such as opening cooling centers and public pools, coordinating with health care facilities, etc.

Adaptation measures to respond to urban heat may include:

- Develop heat wave emergency response systems (cooling centers, public communications, and coordination with social services organizations).
- Integrate urban heat actions into long-term planning (strategies to reduce urban heat island as part of public actions (parks and rights-of-way improvements) and private actions (site plan review).

- Encourage heat mitigation solutions in new development (cool roofs and pavement, green building envelopes, street trees, urban forest, limited use of reflective building materials, and alternative Support the role of the City's Public Works Forestry program to maintain existing trees while also seeking opportunities for planting new trees on public land

greenWP 25

Retrofit existing buildings to be more adaptive to impacts of climate change.

Impacts of climate change, such as extreme weather events, extreme heat, and flooding, can increase the risk and vulnerability of existing buildings. Retrofitting existing buildings to be more adaptive to climate change can reduce damages and costs associated with extreme events and reduce health impacts on building occupants. Adaptation measures for climate hazards could include:

- Extreme weather events: demand response programs to reduce electricity use during peak periods to prevent power outages; energy storage to provide backup power during power outages.
- Extreme heat: measures to reduce indoor temperatures such as improved insulation, passive cooling, shading, and cool roofs; ensuring that buildings housing vulnerable populations have adequate mechanical ventilation and cooling.
- Flooding: For buildings located within flood zones, relocate mechanical systems above flood levels, elevate buildings within flood prone areas, and reduce impervious surfaces outside of buildings.

*green*WP

Appendix



*green*WP

CLIMATE CHANGE PRIMER

There is widespread consensus that there are natural causes of climate change, as well as anthropogenic changes, which have rapidly amplified over the past century. Natural climate changes result from any tip in the balance between energy entering and leaving the Earth's atmosphere, as shown in the illustration created by the United States Department of the Interior, National Park Service (Source: Will Elder).

Causes of Climate Change - Globally

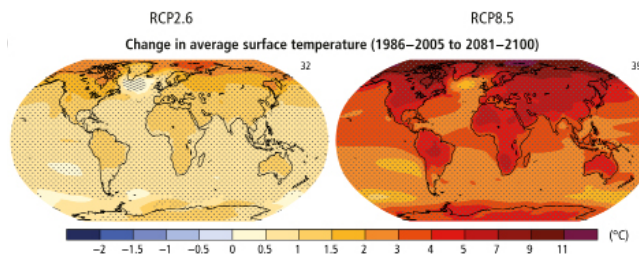
Changes in the Earth's climate over time are often due to natural causes such as changes in solar energy, volcanic eruptions, and natural changes in Greenhouse Gas (GHG) concentrations. GHGs like carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) absorb energy, slowing or preventing the loss of heat to space. In this way, GHGs act like a blanket, making Earth warmer than it would otherwise be. This process is commonly known as the "greenhouse effect." Although the earth's climate is known to experience these natural shifts over time, there has been a documented increase in GHGs due to human activity.

Oceans absorb and store this excess heat, which causes glaciers to melt, resulting in an increase in the volume of water (Sea Level Rise). Increased heat also impacts the general circulation of the atmosphere. Scientists have observed a shift in the latitude of large wind patterns, expansion of tropical belt currents, strengthening of westerly wind systems, and increased hurricane intensity within the Atlantic Ocean.

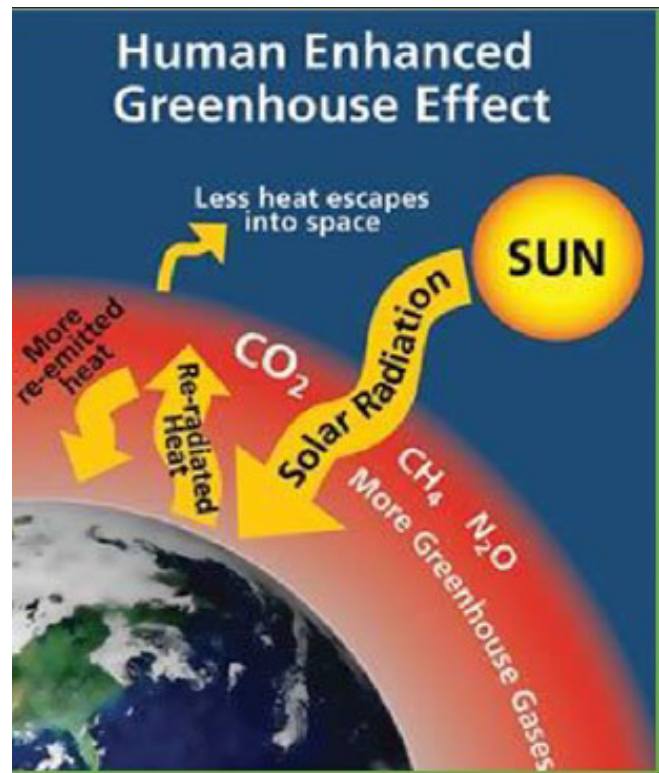
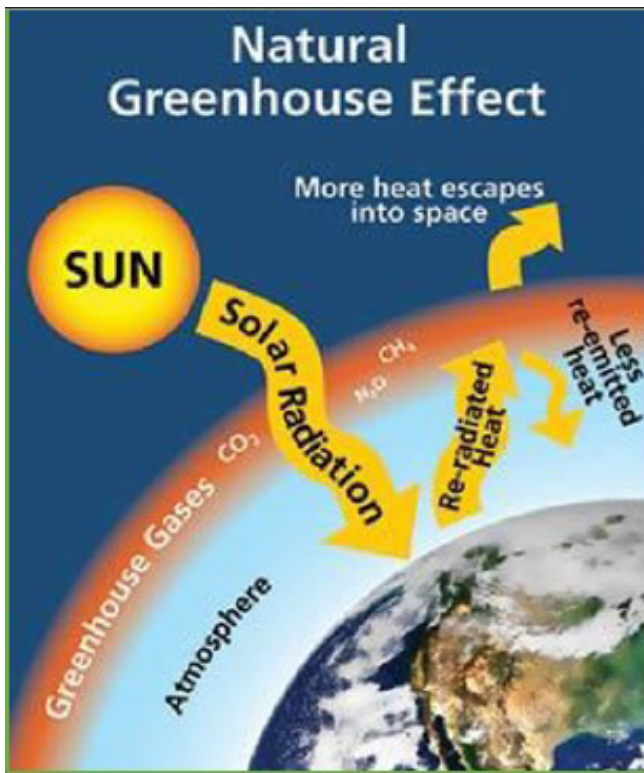
Anthropogenic (human-induced) climate change is a difficult subject to comprehend because its causes are largely invisible to the human eye. However, every day, all around us, carbon dioxide, methane, nitrous oxide, and other greenhouse gases are emitted by automobiles, buildings, airplanes, factories, and power plants. Most human sources of energy currently come from non-renewable energy sources such as: petroleum, natural gas, coal, and nuclear electric power. Fossil fuels such as petroleum, natural gas, and coal have extremely high energy content and have historically served as the driving force behind industrialization, population growth, and economic development. However, there are several

problems associated with the conversion technologies used to turn the stored chemical energy in fossil fuels into active thermal energy (e.g., combustion), including the generation of GHGs. An exponential "spike" in GHG emissions occurred during the 1800-1900's. There was then an extreme jump from the preindustrial revolution era to 2008, revealing approximately a thirty-three percent (33%) increase in GHGs. This led to the Intergovernmental Panel on Climate Change (IPCC) producing their sixth assessment report (AR5) (IPCC, 2014), which included a new approach to climate change forecasting built around the concept of Representative Concentration Pathways (RCPs). RCPs are concentrations of greenhouse gases (GHG) and pollutants resulting from human activities, including changes in land use. The four RCP scenarios established are consistent with certain socio-economic assumptions as follows:

1. RCP 8.5 – Highest Emissions - A future with no policy changes to reduce emissions with increasing greenhouse gas emissions that lead to high greenhouse gas concentrations over time.
2. RCP 6 – Intermediate High Emissions - Stabilization of re-radiated heat shortly after year 2100, via the application of a range of energy efficiency technologies and strategies that reduce greenhouse gas emissions.
3. RCP 4.5 – Intermediate Low Emissions - Stabilization of re-radiated heat shortly after year 2100, consistent with a future with relatively ambitious emissions reductions.
4. RCP 2.6 – Lowest Emissions - Ambitious GHG emissions reductions resulting in reduced re-radiated heat.



Source: IPCC, 2014



Source: Will Elder, United States Department of the Interior, National Park Service

Impacts of Climate Change

Often times, the most discussed impacts of climate change are limited to sea level rise caused by global warming. However, as an inland community, there are several other climate hazards that are projected to impact the City of White Plains in the coming years. Some of these hazards have already been measured in the mid-Hudson region, including extreme precipitation and extreme temperatures.

Many climate-related impacts have already been observed in New York State over recent decades. These impacts are projected to worsen and become more frequent as a result of climate change. Therefore, even though it is critically important for cities like White Plains to continue to show leadership in implementing strategies to mitigate climate change, it is just as important for the City to begin adapting to the impacts that we are already experiencing—and are projected to experience in even greater degrees in the coming years.

Across New England and New York State, Sea Level Rise (SLR), intense precipitation (“Cloudburst” events), erratic temperatures, and drought conditions have already occurred over the past few decades. According to the US Environmental Protection Agency, New York state has warmed one to three degrees (F) in the last century.

Annual temperatures in New York State have increased by about 0.6°F per decade since 1970, which is projected to rise by 4.1°F to 6.1°F by 2080 (Table A-1). In White Plains, the projected annual average temperature is expected to rise by 4.5°F to 6.2°F. Extreme temperatures are also expected to increase. Extreme heat days are defined as those with maximum temperatures above 90°F. Heat waves are defined as periods of three or more consecutive days with maximum temperatures above 90°F. The frequency of heat waves has increased in New York State since the 1960s. In White Plains, this amounts to as many as 27 – 41 additional extreme heat days by 2050.

Average annual precipitation in the Northeast has increased 10% since 1895, and precipitation from extremely heavy storms has increased 70% since 1958. During the next century, annual precipitation and the frequency of heavy downpours are likely to keep rising. Higher water levels are eroding beaches, submerging lowlands, and exacerbating coastal flooding. Evidence of these adverse impacts have been illustrated via the results of intense coastal storms such as Hurricane Ida and Superstorm Sandy.

Ida caused extreme damage in Louisiana, and as the system moved to the Northeast, its remnants spawned several tornadoes, dropped record rainfall resulting in Cloudbursts (intense flash-flooding) throughout the region. Ida was estimated to have caused approximately \$7.5–9 billion in damages across New York¹, in addition to at least 16 fatalities.

In the coming decades, the changing climate is likely to increase coastal and inland flooding, disrupt farming and winter recreation, and increase some risks to human health. According to an analysis by the New York State Department of Environmental Conservation (NYS DEC), some of the climate hazards projected to impact communities like White Plains include increased frequency of high-intensity storms, increase in average annual precipitation, increase in average annual temperatures, and increase in extreme heat events.

Increased frequency of high-intensity storms

More frequent extreme precipitation events have been observed in the Northeast, including New York State, for several decades.² This trend is expected to continue as climate change worsens. “Cloudburst” events, defined as a sudden, extreme downpour in a short period of time, have become more frequent throughout the United States and the northeast. Cloudburst events can be unpredictable, dropping copious amounts of rainwater, in excess of the rain events that municipal storm sewers were designed for. As a result, cloudburst events lead to rainwater flooding in areas outside of the FEMA floodplain, because flooding results from over-capacity sewer lines, not storm surge or overtopping of stream banks.

¹ Beven, John L.; Hagen, Andrew; Berg, Robbie (April 4, 2022). Tropical Cyclone Report: Hurricane Ida (PDF) (Report). Miami, Florida: National Hurricane Center. Retrieved April 5, 2022.”

² Observed and Projected Climate Change in New York State, NYS DEC, August 2021.

One recent example of a cloudburst event that impacted White Plains and the broader region was Tropical Depression Ida. Ida set precipitation records throughout the region, dropping 3.15” of rain in Central Park within one hour. In White Plains, Ida caused flash flooding in the following areas:

- The Bronx River Parkway
- Adjacent to both the White Plains and North White Plains Metro-North stations
- Cloverdale Avenue
- Rosedale Avenue
- Areas around Prospect Avenue and Livingston Avenue

Because these storm events are different from the types of storms that cause flooding from waterways, at-risk areas may not be included in FEMA flood mapping. Therefore, localized analysis of potential flood impacts is critical to provide information to keep residents safe and to help the City develop solutions to adapt to these more frequent extreme weather events.

Increase in average annual precipitation

Increase in annual precipitation has been observed in New York State over the past century. In the future, most of the increase in annual precipitation projections is expected during the winter and spring months.

Increase in average annual temperatures and extreme heat events

Annual temperatures in New York State have increased by about 0.25°F per decade since 1900. This warming has accelerated in recent decades, with the statewide annual average temperature rising by about 0.6°F per decade since 1970. Annual average temperatures in New York State are projected to rise by 4.1°F to 6.1°F by the 2080s. In White Plains, the projected annual average temperature is expected to rise by 4.5°F to 6.2°F.

Extreme temperatures are also expected to increase. Extreme heat days are defined as those with maximum temperatures above 90°F. Heat waves are defined as periods of three or more consecutive days with maximum temperatures above 90°F. The frequency of heat waves has increased in New York State since the 1960s. As climate change progresses, the total annual number of extreme heat days and the frequency and duration of heat eaves are projected to increase. In White Plains, this amounts to as many as 27 – 41 additional extreme heat days by the 2050s.

Table A-1: Observed and Projected Climate Change in New York State

Climate Change Impacts	Projected Changes
(2050s, Middle Range)	100 Main Street
Average Annual Temperature	+4.5°F to +6.2°F
Extreme Heat Events (days over 90°F)	+27 to 41 days
Extreme Precipitation (Days over 1" Rainfall)	+11 to 12 days
Average Annual Precipitation	+4% to +12%

Source: NYS DEC, August 2021

U.S. and International Actions on Climate Change

In 2015, the Paris Agreement established a goal of limiting global warming to 1.5°C. Global temperatures have already increased to about 1.1°C above pre-industrial levels and the impacts on the climate have already been observed through higher sea levels, increased extreme rain events, and more frequent and intense heat waves. Any incremental increase in global temperatures can lead to increased impacts on the climate. Climate scientists project that crossing the 1.5°C threshold will cause severe impacts on people and the natural environment, including sea level rise, heavy precipitation, tropical cyclones, drought, extreme heat, species loss, and other climate hazards.¹

The Inflation Reduction Act (IRA) of 2022, which was signed into law in August 2022, is perhaps the largest investment ever by the United States in policies to combat climate change. The bill includes funding to reduce pollution, improve clean transit, make renewable energy and energy efficiency retrofits more affordable, and

strengthen resilience to climate change impacts. In total, IRA includes nearly \$370 million in investments to combat climate change. Adoption of this landmark legislation by the federal government provides an opportunity for White Plains to continue expanding climate adaptation and mitigation leadership at the local level. While IRA represents long-overdue action at the national level, much of the funding will be distributed to residents, businesses, and local governments.

The City has a critical role to play in guiding local action, whether that action utilizes funding through IRA or other sources.

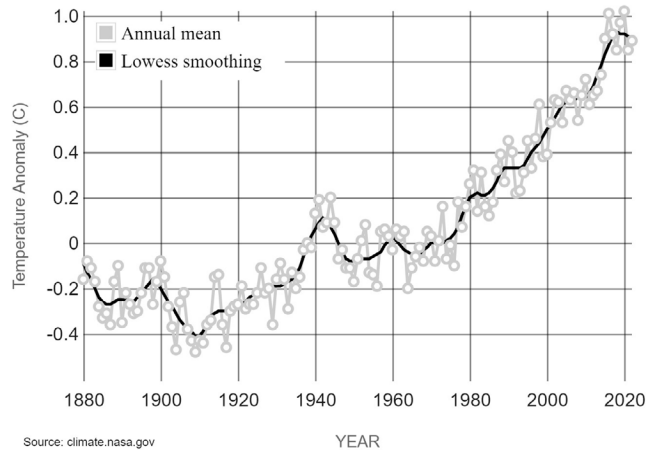
In New York State, impacts of climate change have already been observed, and many climate hazards are projected to worsen in the coming decades. Climate impacts such as warming temperatures, sea level rise, increased rainfall, more extreme heat waves, and warmer winters all threaten habitat and ecosystems, local economies, recreation and tourism, and quality of life for New Yorkers. In 2021, New York State Department of Environmental Conservation (NYSDEC) released Observed and Projected Climate Change in New York State. This report documents changes in climate that are already underway and includes projections for additional climate change in the future. These changes are sorted by potential climate hazards such as extreme temperatures, extreme precipitation, ocean warming, sea level rise, and

¹ IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24, doi:10.1017/9781009157940.001.

coastal storms. Details from this report that relate to White Plains are summarized in Existing Conditions/Climate Resilience and Adaptation, below. New York State has also been tracking observed and projected climate impacts since as early as 2011. Responding to Climate Change in New York State (New York ClimAID) was first released in 2011 and later updated in 2014. ClimAID provides information about climate change impacts and adaptation strategies in New York related to water resources, coastal zones, ecosystems, agriculture, energy, transportation, telecommunications, and public health.

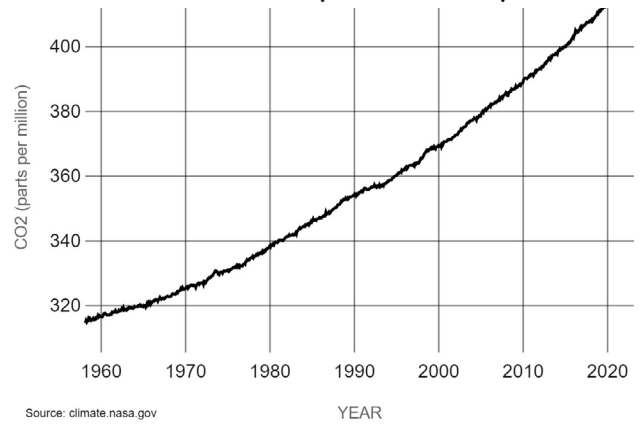
Although these national and international efforts demonstrate progress in addressing the impacts of climate change, White Plains is in a position to be innovative and demonstrate how small cities can lead the way.

Global Land-Ocean Temperature Index



NASA Goddard Institute for Space Studies
Source: NASA/GISS (<https://climate.nasa.gov/vital-signs/global-temperature/>)

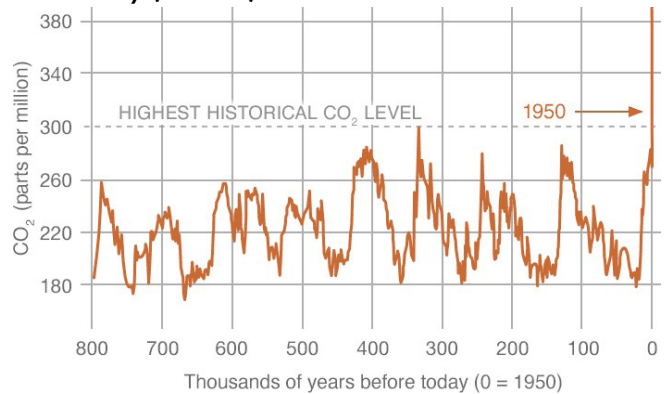
CO2 Direct Measurements (2005 - Present)



Monthly Measurements (average seasonal cycle removed)

Source: NOAA (<https://climate.nasa.gov/vital-signs/carbon-dioxide/>)

CO2 Proxy (Indirect) Measurements



Reconstruction from ice cores

Source: NOAA (<https://climate.nasa.gov/vital-signs/carbon-dioxide/>)

Figure A-1: Blue-Green Infrastructure Components

Source: Ramboll

What is Blue-Green Infrastructure?

