

Village of Lancaster Climate Resilience Plan



A Message from the Mayor

The Village of Lancaster's first Climate Resilience Plan represents an important milestone in the process of preparing our community for extreme weather and natural hazards, which are expected to occur with greater intensity and frequency in the future. It also demonstrates the ability of Village of Lancaster residents, elected leaders, and stakeholders to work together to plan for the future and take action. The plan identifies ways we can collectively adapt to climate-related challenges and create stronger, more resilient infrastructure and services in the Village of Lancaster.

The adoption of the Village's Climate Resilience Plan represents a commitment on the part of my office and the Village Board to ongoing efforts to address climate-related hazards in our community. This will include protecting natural assets, improving infrastructure and emergency preparedness, and prioritizing the safety and quality of life for all residents for decades to come.

As a Bronze Certified Climate Smart Community, the Village of Lancaster has already taken steps toward the goals of climate resilence and creating a sustainable community. While this plan does not determine a specific course of action that the Village of Lancaster must take, it includes recommendations for the Village to consider in the future and lays out a course of action to continue to build a more resilient Village.

The Plan's strategies are built to support ongoing Village initiatives, these include: upgrading sewer systems to mitigate flooding; promoting green infrastructure on public and private property; bolstering climate education, awareness, and household hazard preparedness; helping property owners improve their properties to mitigate hazards; and acquiring additional funding to support climate resilience actions from the Village.

The Village of Lancaster will soon begin the process of updating our Comprehensive Plan to represent the initiatives that have been prioritized by our community members. The findings and recommended strategies of this plan will help shape the new Comprehensive Plan and future community investments.

I wish to thank all the community members, the Climate Smart Task Force, Village staff, the University at Buffalo Regional Institute, and others who committed time and energy to create this document.

While we never know exactly the challenges that may arise in the future, I am confident our Village is on a path to becoming resilient to climate-related threats by informing and equipping ourselves for action and re-committing to looking out for each other and the community we call home.

Sincerely, Mayor Lynne Ruda

Acknowledgements

This plan is a result of the contributions of many groups and individuals. The Village of Lancaster Climate Smart Task Force, Mayor Lynne Ruda, and Sustainability Coordinator Amy Stypa were pivotal in shaping the planning process, guiding the engagement of the community and stakeholders, and developing the plan and its recommendations. Village staff members and other local partners provided input on the plan's recommended strategies. The project was steered by the University at Buffalo Regional Institute (UBRI), through its role as the regional Climate Smart Communities coordinator, and was funded through the NYS Department of Environmental Conservation's Climate Smart Communities program. Leah Bargnesi and Nayarit Tineo, graduate students of the University at Buffalo, assisted UBRI in the plan's development.

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Executive Summary

The purpose of the Village of Lancaster Climate Resilience Plan (the Plan) is to **identify strategies to reduce the risk of potential impacts of climate hazards** over the long term and **build capacity to adapt** to on-going changes. This document **builds from existing planning documents** and projects the Village of Lancaster has developed in recent years. The Plan presents the **most pressing climate hazards** the Village is likely to experience, along with an assessment of **local vulnerabilities**, and ends by presenting **seven recommended strategies** for continuing progress toward building climate resilience in the Village of Lancaster.



PROCESS

Working with Village department heads, first responders, staff, elected officials, and stakeholders, the **Climate Smart Task Force** and the **University at Buffalo Regional Institute (UBRI)** worked to develop this long-range, planning document. By looking at **existing trends, future projections, and recent extreme events** the team **identified critical assets and areas** within the Village that may require additional attention and support as issues related to **Flooding, Extreme Heat, and Severe Winter Weather** events become more common over time.

Stakeholders workshopped various climate scenarios in order to identify strategies that would **help reduce risks, save taxpayer dollars, and save lives** while **improving operations** for first responders, **help residents be prepared for extreme events**, and improve the Village's overall ability to respond to naturally occurring events that are becoming more extreme over time.



HOW TO USE THIS DOCUMENT:

This document provides a starting point for an ongoing process to promote climate resilience in the Village of Lancaster. The plan and its recommended strategies are intended to inform the Village's future planning processes, including the Comprehensive Plan update, where the strategies included here can be refined and moved toward implementation.

RECOMMENDATIONS

The strategies outlined in this document are intended to be **implemented** over time by the community as a whole, and are not mandated actions for local government.

Although Village Hall has a role to play, implementation of the recommended strategies will also require involvement from residents, businesses, landowners, and community groups.

Coordination with surrounding municipalities will also be vital to ensuring the Village can continue to be resilient in the face of increasing extreme weather events. Several **"cross-cutting"** strategies emerged from the planning process, which would support the Village's overall capacity to implement climate resilience measures across all hazard types. These include: climate education and outreach, enhanced emergency operations, and securing dedicated climate adaptation funding.

Recommendations	Description	Hazards adressed
Enhance emergency operations for extreme weather events	Continue to enhance local emergency operations and communication systems and adapt these systems to changing climate hazards.	
Bolster climate awareness and household hazard preparedness through education and outreach	Make households more aware and prepared for climate hazards through strategic education and outreach, technical assistance, and funding.	
Promote sustainable development and protect natural areas through land use regulations	Use land use planning, policies, zoning, and incentives to encourage development in previously developed areas to conserve and enhance natural areas, limit new infrastructure needs, and mitigate hazards.	
Upgrade stormwater & sewer systems to mitigate flooding	Continue to make cohesive, strategic efforts to maintain, update, and enhance the Village's sewer and stormwater systems to prepare to manage more extreme precipitation events.	
Promote green infrastructure on public & private property	Increase the use of green infrastructure in public places and on residential and commercial properties through strategic planning, education and outreach, technical assistance, funding, and incentives.	
Help property owners upgrade structures to mitigate hazards	Provide homeowners with financing, funding, technical assistance, and other supports to encourage improvements to energy efficiency and increase ability to handle climate hazards.	
Increase the use of climate-resilient building materials	Provide building owners, developers, and homebuilders with incentives and technical assistance to utilize building materials that will reduce heat island effects, protect from flooding, and minimize other impacts related to extreme weather.	

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RECOMMENDED **STRATEGIES FOR CLIMATE RESILIENCE**

Enhance emergency pg. 37 operations for extreme weather events

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- Bolster climate pg. 38 awareness and household preparedness throught outreach and education
- **Promote sustainable** pg. 39 development and protect wetlands and natural spaces
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KEY TERMS

Climate hazard – natural hazards, such as flooding, extreme heat, drought, severe storms, and other meteorological events that can cause harm to people and properties and negatively impact communities, economies, and infrastructure systems.

Risk – the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.

Exposure - the degree to which elements of an asset or system are in direct contact with hazards or sensitive to climate variability and the degree to which the hazard may change over time.

Vulnerability – characteristics of community assets that make them susceptible to damage from a given hazard.

Resilience – the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning; the capacity for self organization and the capacity to adapt to stress and change.

Mitigation – efforts to avoid or reduce hazard risks and impacts on people, nature, and the built environments over the long term.

About the Climate Resilience Plan

While Earth's climate has changed throughout its history, there is unequivocal evidence that global temperatures are rising at an alarming rate that has not occurred in the past 10,000 years.¹

Global climate changes are also resulting in more localized climatic impacts, which may pose significant challenges for the health, safety, quality of life, and economic vitality of communities of all sizes. To minimize risks in these areas, municipalities like the Village of Lancaster are developing climate resilience plans, to build a deeper understanding of potential hazards and identify strategic ways to adapt to new and changing conditions.

The purpose of the Village of Lancaster Climate Resilience Plan (the Plan) is to identify strategies to reduce the risk of potential impacts of climate hazards over the long term and build capacity to adapt to ongoing changes. These strategies are designed to be cost-effective, informed by the latest scientific data, applicable to local conditions, and reflective of the interests and priorities of Village residents, elected officials, and staff. As such, the Plan may serve as a useful tool to inform decision-making about future projects and programs that the Village of Lancaster may consider.

The Plan was developed over eight months (October 2023 to May 2024), as a collaborative process led by the Village of Lancaster Climate Smart Task Force (the Task Force) and the University at Buffalo Regional Institute (UBRI), with extensive feedback from the community and stakeholders. The UBRI planning team serves as the regional coordinator for the NYS Department of Environmental Conservation (DEC) Climate Smart Communities program, through which it supports municipal climate resilience planning efforts. The Task Force provided oversight and input throughout the process and supported outreach to various stakeholders. Community members and local stakeholders provided extensive input, through an online survey, scenario planning workshops, a public meeting, and online feedback on the plan draft, which shaped the plan's understanding of local conditions and recommended strategies.

The overall process of the Plan's engagement strategy is documented through meeting agendas, outreach materials, and stakeholder feedback, included in the Appendix section.



Community Engagement Process

A key objective of this plan is to understand the concerns that the Village has related to evolving climate hazards and to reflect their priorities in the resilience strategies that are recommended. This was accomplished through several distinct methods of **community and stakeholder engagement.**

An online **community survey** was the foundational engagement piece for this plan. The survey included questions about residents' experience of extreme weather events, areas of concern, levels of knowledge and preparation, and preferred resilience strategies to address climate hazards. Responses informed the formulation of the plan's recommended strategies, as well as the Community Vision.

In-person **scenario planning workshops** were conducted to identify local vulnerabilities and priorities for future actions to build resilience, based on projected climate conditions for the 2050s. A workshop for "internal stakeholders," individuals involved with the village's operations, was held in December 2023 and a similar workshop was conducted with Lancaster youth in March 2024.

A **presentation of the Plan to the Village Board and members of the public** was held in May 2024, followed by a period of **public review** of the final draft. Feedback from the Village Board and community members was incorporated into the final version of the Plan, which was presented to the Village of Lancaster's Board for approval in May 2024.



What we heard from the community

Community Survey (

The planning team and CSC Task Force developed a community survey to identify the climate hazards that concern Village residents and priorities for potential adaptation strategies, and to help establish the community vision.

The survey was promoted at inperson events, by fliers posted in public areas, and through the Village's social media accounts and newsletter. Survey responses were collected between the months of September 2023 and March 2024.

A total of 120 individuals completed the community survey. Survey respondents generally aligned with the Village's demographic profile, though respondents tended to be slightly older and have a higher level of education than the Village as a whole. The climate hazards of greatest concern to community members include severe winter weather (snow, ice, extreme cold), extreme heat, severe winds, and flooding (see p. 12). These results were used to inform analysis conducted for this plan and the hazard scenarios for the stakeholder workshop.

Respondents also weighed in on potential strategies the Village could employ to become more resilient to climate hazards (see p. 13). These findings were an essential input to the formation of this plan's recommended strategies.



Who took the survey



62% think Climate Change will impact them personally

46 respondents own a home in the Village

10 Lancaster **business** owners

49% Female

89% white

52% have a Bachelor's degree or higher

80% over age 35

TOP SOURCES FOR NATURAL HAZARDS INFORMATION

- 1 TV News/Advertising
- 2 Police, Fire, EMS, 9-1-1
- 3 Radio News/Ads
- 4 County Government
- 5 Social Media

Community Vision

VISION STATEMENT:

The Village of Lancaster will be prepared for climate change when...we are informed and equipped to safely withstand and recover from severe weather events and adapt to changing climate conditions to ensure the well-being of our people, economy, and natural environment.

Through the community engagement process, residents were asked to comment on their vision for the Village of Lancaster's climate future by completing the sentence: "The Village of Lancaster will be ready for climate change when..." The recurring themes from the responses to this prompt were then synthesized to compose a Community Vision statement, which was reviewed and revised by the Climate Smart Communities Task Force.

The objective of the Community Vision statement is to orient community leaders as they undertake future climate action within the Village.

Throughout the responses, an emphasis was placed on ensuring that the Village's **infrastructure has the capacity to withstand extreme weather events** and that **municipal services**, such as snow plowing, are delivered in an efficient manner following major weather events. Other **key themes** that emerged included: **household preparation** to keep all residents safe during extreme weather events; using clean energy supply and **reducing emissions** along with climate adaptation; ensuring emergency plans incorporate evolving climate hazards; the necessity of **public information and climate education**; and **protecting existing natural resources**.

Insights from the community survey



WHICH NATURAL HAZARDS ARE YOU STRONGLY CONCERNED ABOUT?



30% of respondents feel their
household is very well prepared for a day or more without heat or electricity.
9% do not feel prepared at all.

41% have suffered damages

to their homes or business caused by climate hazards Village residents rated the Village at 6 out of 10 for preparation for climate change. "I am worried about how flooding and water issues may impact my foundation and basement."

"Wind and snow storms damage infrastructure and impact travel."

"The storms are likely to get worse and as water issues get worse across the country, it's possible other regions will look to our lakes as source for them which will make us more dependent on ground water."

> "As a firefighter we are emergency responders during major weather events."

"Aside from the typical annual winter cold, the occasional WNY blizzards have impacted us, [...] our fence was permanently damaged from the blizzards.

"Shingles repeatedly fly off my home during high wind days."

"Basement flooding from heavy rainstorms."

Sources: UBRI Analysis of Community Survey Results

WHICH APPROACHES TO BUILDING RESILENCE DOES THE COMMUNITY SUPPORT?



TOP WAYS RESPONDENTS SAY THEY HAVE PREPARED FOR HAZARD EVENTS

- Installed smoke detectors on each level of home
 Stored flashlights and
- batteries
- **3** Stored a fire extinguisher

Over

65% know where to go and how to get there in case of an emergency

The majority of survey respondents agree that **emergency/backup power at home** and **transportation** would best **assist vulnerable community members** to better prepare for, cope with, and recover from the impacts of hazard events

Sources: UBRI Analysis of Community Survey Results

About the Village of Lancaster



The Village of Lancaster is located within the Town of Lancaster in Erie County, New York. The Village was incorporated in 1849, and is approximately ten miles east of the City of Buffalo. The Village has long been the residential and commercial hub of the Town of Lancaster.

Lancaster was originally inhabited by the Seneca tribe of the Haudenosaunee Confederacy. The Seneca were allied with the British army during the American Revolution, and were subsequently removed from their villages and relocated to twelve reservations tracts.² In the early 1800s, settlers from New England moved into Western New York to farm or establish businesses. The Village of Lancaster was formed around a grist mill and later transformed into a market town for agricultural products from the surrounding area.³ The Village of Lancaster has eleven historical buildings recognized under the National Register of Historical places.



Demographics

The Village of Lancaster is home to 10,160 people, as of the most recent American Communities Survey 5-Year Estimates (2018-2022). Its population has been relatively stable in recent decades, though its residents are older, on average, than Erie County as a whole. Residents 65 and older, who make up 19.9% of the population, have increased by 3.8% since 2015. Residents under 18 years of age make up 17.7% of the population, an increase of 4.7% since 2015.⁴

The average number of people per household in the village of Lancaster is 2.02. The large majority of the population (93%) have graduated from high school and 27% have a bachelor's degree or higher. The median household income in the Village is \$61,646 compared to the Erie County median household income of \$62,578.⁵

Economy

There are 3,839 jobs in the Village, but only 10% of residents who work in the Village also live there. The average commute time for residents to get to their place of work is 18 minutes.

5.5% of the Village's population has household income that is below the poverty line. This portion of the Village's population may be more vulnerable to climate hazards or may lack the necessary means to prepare for such events.

The Village of Lancaster's downtown is undergoing a major revitalization, bringing economic development to the Village's core by expanding pedestrian amenities, building new mixed-use spaces, and adding green infrastructure while retaining the Village's rich historic character. This revitalization also plays a role in Lancaster's overall climate resiliency.

Village of Lancaster Population and Economy

Total Popula	10,160	
Population Change, 2012-2022		-1.8%
	Madian Ara	16
		40
AGE	% Over 65	10.09/
	% 0ver 65	19.9%
	% White	97.4%
	% Black	0.01%
	% Hispanic	1.6%
RACE/	% Asian/Pacific Islander	0.4%
ETHNICITY	% Other/Multiple Races	2.2%
	Foreign Born Population	0.1%
	% Households with One Person	42%
Median household Income		\$61.646
Poverty Rate		5.5%
Jobs		3,839
Employed Residents		5,126
% 25+ with Bachelor's +		26%
% of Workers in Lancaster who also live in Lancaster		10%
	Avg Commute Time	18 min.
% Working from Home		7%

*Highlighted numbers are higher than US averages.

Land Use

Depending on how land is used, it can work to build resiliency from climate hazards or emphasize the negative impacts of climate hazards. As a historic village, Lancaster is highly built-out with limited capacity for further land conversion for development.

The Village of Lancaster is largely composed of residential neighborhoods (50% of land area). Eight percent (8%) of land is used for commercial activity in areas concentrated near the Village's downtown and along arterial roads and railways. Another 10% is dedicated to community services (including schools and public facilities), 8.1% of the land is industrial, and 9.9% of the Village of Lancaster is made up of parks and open spaces. Almost 11% of land in the Village is classified as vacant in the tax parcel data, however this includes parcels adjacent to a major east-west rail corridor and other properties currently used for parking or other low-intensity uses. Thus, not all land that is classified as vacant would be available for new uses. The map also may not reflect some of the most recent development in the Village's downtown that has been completed since the data's publication.

Housing Units	5,170
Vacancy Rate	4%
Home Value	\$170,100
Median Year Built	1954
% Renter Occupied	27%

Village of Lancaster, Housing, 2021

Source: US Census, ACS, 5-year estimates, 2022.



Village of Lancaster Land Use, 2022

Residential	50%
Vacant	10.8%
Parks/Open Spaces	9.9%
Community Srvcs.	9.8%
Industrial	8.1%
Commercial	8.1%
Other	2.1%
Mixed Use	0.8%
Recreation	0.3%

Source: Erie County Tax Parcel Data, 2022.

Note: Parcels are classified for tax assessment purposes, which may not accurately represent how land and buildings are currently used.

Environmental Areas

Environmental areas are critical to building climate resilience. Green space, wetlands, and trees all provide natural benefits to reduce the impacts from extreme heat and flooding. In the Village of Lancaster there are 142.8 acres of parks and open space. In 2019 a tree inventory was conducted and found that there are nearly 4,000 trees along streets and in parks that are publicly maintained. There are no wetlands that are regulated by the NYS Department of Environmental Conservation (DEC) in the Village, but the Village does contain 48.5 acres of other non-DEC regulated wetlands.

Village of Lancaster Environmental Areas

Developed Area	2 sq. miles
% Impervious Surfaces	36.5%
Wetlands	48.5 acres
Parks and Open Spaces	142.81 acres
Vacant Land	132 acres
# of trees	3,960

Sources: USGS, National Land Cover Dataset, 2021; USGS, Impervious Surfaces, 2021; National Wetlands Inventory 2023; Erie County Tax Parcel Data 2022; Village of Lancaster Tree Inventory, 2019. For additional info, see Data Sources and Notes.⁷



Village of Lancaster Environmental Areas, 2021

Wetlands

Open Grass/Shrublands

Forests

Parks and Open Spaces

Sources: USGS, National Elevation Dataset; National Land Cover Database USGS 2018; New York State Department of Environmental Conservation - National Wetlands Inventory 2023.

Recent and Future Development

The Village of Lancaster is mostly built out with recent development occurring in the Village's core, near the Main Street Extension. This development included the extension of West Main Street between Central Avenue and Aurora Street, shifting from a one-way to a twoway street. This extension also added a mini roundabout at West Main and Aurora Street. These enhancements create opportunities for a more walkable "shop, stroll, and stay" experience. The new street design also allows better access for pedestrians and bicyclists to get around more easily and safely. The footprint of the project area also includes about 132 acres of vacant land that has been identified for future development.

The Town of Lancaster, which surrounds the Village on three sides, was one of Western New York's fastest growing suburbs between 2010 and 2020, according to the decennial US Census.⁸ As formerly forested areas and farmland are developed, the land's natural ability to absorb rain and snowmelt is inhibited, which may result in downstream flooding of Cayuga Creek in the Town's "Twin Villages" of Lancaster and Depew. This upstream development may result in additional costs incurred by the Village to address infrastructure and implement flood mitigation measures, so it will be important for the Village to coordinate with neighboring communities within the Cayuga Creek Watershed to mitigate flooding impacts associated with upstream development.



Vacant Parcels

Potential Underutilized Parcels

Structures Built after 2010

Parks and Open Spaces

CAYUGA CREEK PARK CONSTRUCTION

In the map below, properties are classified as 'vacant' based on the tax parcel data but may not be available for development, as in the case of the railway right-of-way near the northern boundary of the Village. 'Potentially underutilized parcels' are those with structures with less value than the land on which they are located, although the properties may currently be used for a variety of purposes.



Sources: Erie County Tax Parcel Data, 2022.

Note: Parcels are classified for tax assessment purposes, which may not accurately represent how land and buildings are currently used.

Critical Assets

Protecting critical assets and infrastructure in the Village will be integral for any future climate planning as these assets provide access, connectivity, and critical services during major climate disruptions. These assets include buildings, bridges, electric sub-stations, and County and Village assets and structures that are important to maintaining operations. To be more resilient, these assets will need to withstand the increased frequency of localized flooding, more extreme weather events, and provide safe haven for vulnerable residents during extreme events.

Although many of the major bridges in the Village are not in need of immediate repair, they are all over 20 years old and provide important connectivity for the Village. Many other assets such as schools, fire halls, and the Town's senior and youth centers, are in neighborhoods and may require neighborhood specific planning if these places are expected to be leveraged for community support during extreme events. Considering back up generation and reliable renewable energy to increase the resiliency of these places would ensure they are able to provide essential community services during extreme events.





Critical Assets in the Village of Lancaster

Gov. Office Buildings

Electric Substations

Senior Living Facility

Parks and Open Spaces



NYS DEC Remediated Sites and Potential Brownfields

Source: Various sources, see data notes.9

Planning Context

A number of previous plans informed this development of this plan. In particular, the Erie County 2022 Hazard Mitigation Plan and the Village of Lancaster Extreme Weather **Vulnerability Assessment** helped to build a foundation for this plan's analysis by identifying the hazards the Village of Lancaster is likely to experience in the near- and long-term future. The 2018 Joint Comprehensive Plan between the Town of Lancaster, Village of Lancaster, and Village of Depew also informed this process, outlining a set of goals and a vision for the community from the recent past upon which this plan will build.

The aforementioned plans demonstrate the community's commitment to open space preservation, sustainable development, hazard mitigation, and economic revitalization. Links to the plans that were reviewed are included in the appendix materials on page 51.

Beginning in 2024, the Village of Lancaster will undertake a process of **updating its** Comprehensive Plan. This climate resilience plan may be a useful tool for ensuring that evolving climate concerns are addressed in the new version of the Comprehensive Plan.

Initiatives to build on

The Village of Lancaster is already addressing identified hazards through projects and policies including...

Green Infrastructure:

Transformation of an underutilized parking lot to Cayuga Creek Park has allowed the Village to leverage green infrastructure and nature based solutions to address flood risks along Cayuga Creek and provide a great public space in Downtown Lancaster.

Tree Planting

Plan. The Village's Tree Board has developed a plan to guide future tree planting and maintenance, detailing priority locations and preferred species. Implementing the plan will help to build biodiversity within the Village's tree stock.



Public Electric Vehicle Charging: The Village has secured several grants from New York State

to install EV Charging infrastructure at locations throughout Downtown Lancaster including Cayuga Creek Park and a new mobility hub under development.



Shade Structure Policy. Seeks to provide reprieve from the impacts of extreme heat by increasing

shade structures throughout the Village. Examples of shade structures include trees. gazebos, and other outdoor structures.

Climate Hazards in Lancaster

Based on local geography, ecology, and topography, each community will be impacted differently by climate change. The Village of Lancaster's proximity to Lake Erie (less than 11 miles) is a major factor in determining local weather patterns and future climate hazards.

Scientific research and regional hazard assessments suggest that in Western New York changing climatic conditions are likely to result in **extreme heat, flooding, and severe winter weather** events occurring with greater intensity and unpredictability than in the past. This section discusses the impacts of these emerging climate hazards on the Village of Lancaster and considers three scenarios regarding the potential scale of these hazards by the late 21st Century.¹⁰ The **"Existing"** scenario assumes the continuation of observed historical climate trends. The **"Expected"** scenario is based on climate projections should greenhouse gas emissions remain stable or be reduced, while the **"Extreme"** scenario supposes that GHG emissions continue to increase over time.

Climate Scenario	Description	Annual days with max. temperature above 90°F	Days with max. temperature below 32 °F	Avg annual total precipitation	Annual extreme precipitation events
"Existing"	Climate conditions stay the same from now until 2080. Based on historical data.	3 days	47 days	41"	4 days
"Expected"	Climate becomes somewhat hotter and stormier by 2080. Modeled conditions based on current GHG emissions.	21 days	21 days	43"	6 days
"Extreme"	Climate becomes much hotter and stormier through 2080. Modeled conditions based on increasing GHG emissions.	48 days	14 days	45"	7 days

Sources: U.S. Global Change Research Program, CMRA Assessment Tool using National Climate Assessment LOCA data, 2018; Notaro, Bennington, and Vavrus, "Dynamically Downscaled Projections of Lake-Effect Snow in the Great Lakes Basin," 2014.



In July 2020, Western New York experienced a recordbreaking heat wave. July 9th, 2020, the temperature reached 98° F at the Buffalo Airport for the first time in over 70 years. The record was also broken for the hottest days recorded consecutively. As the climate changes, New York State's climate may begin to resemble that of some southeastern states with shorter winters and longer summers. Under varying climate scenarios, by the end of the century New York State may see an increase in days over 100° F, with entire summers consisting of days over 90° F.

According to the Erie County Hazard mitigation plan (2022), the Village of Lancaster lists extreme heat as a moderate risk with a strong adaptive capacity. This means the Village faces risk in this area, but also has the capability to deal with extreme heat. As an example, the Village of Lancaster has identified facilities that could be used as shelters or temporary housing in case of emergencies, including extreme weather events such as extreme heat, flood evacuation, or blizzards. The Village's Municipal building at 5423 Broadway was identified as a potential cooling shelter location, although additional preparation would be needed for the site, and additional locations throughout the Village may be advisable in order to serve residents who may not be able to access the central location. These facilities should be adequately equipped to keep residents safe and comfortable while they shelter in place during such an event.

Issues related to extreme heat can be compounded by air quality issues. Western New York experienced this firsthand during the summer of 2023 as the Canadian Wildfires raged in Eastern Canada. Resilience strategies developed to address extreme heat can also be implemented for poor air quality issues, such as the use of emergency shelters.

EXTREME HEAT/DROUGHT IMPACTS BY CLIMATE SCENARIO

	"Existing"	"Expected"	"Extreme"
Annual days with maximum temperature > 100°F	0 days	1 days	8 days
Annual single highest maximum temperature °F	91° F	98° F	103° F
Days per year with no precipitation (dry days)	127-134 days	126-154 days	123-167 days
Maximum number of consecutive dry days	8-10 days	8-12 days	9 - 13 days

Source: NOAA, CMRA Assessment Tool using National Climate Assessment LOCA data, 2018. Accessed November 2023 at https://resilience.climate.gov/.



Source: The Trust for Public Land ad National Integrated Heat Health Information System, Heat Severity Index, 2021. Accessed August 2023 at www.heat.gov/datasets/TPL::heat-severity-usa-2021/about

Relative Urban Heat Island Severity



Flooding is a perennial concern in the Village of Lancaster, due to the presence of Cayuga and Plum Bottom Creeks and the area's relatively flat topography. The Erie County Hazard Mitigation plan (2022) rates the Village's risk of flooding as high, with moderate capabilities to manage flood events. Presently, most flooding is caused by ice jams on Cayuga Creek, starting at Bowen Road Bridge, just outside of the Village. When the ice jams break free, they move downstream and amass at the Lake Avenue Bridge and the second Broadway Bridge. Constrictions also occur at the pedestrian bridges at Como Lake Park.

Winters across WNY are projected to continue to be warmer in the future, so floods are less likely to be caused by ice jams than as a result of increased precipitation and storm surges.¹¹ Currently, 100-year and 500-year flood events are relatively contained to the banks of Cayuga Creek, but residences near Como Lake Dam and Lake Ave., and businesses near Main Street and Central Ave. may be more vulnerable to flooding in the near future.¹²

Flash flooding is likely to occur as heavy precipitation in a short period of time increases. Rainfall events producing an excess of 1 inch have increased over the past 50 years. Wind severity is also increasing and interacts with precipitation, creating severe thunderstorm wind events. Western New York has seen an increase of 21.4 thunderstorm wind events per decade. These new conditions have the potential to exacerbate stormwater management issues.¹³

FLOODING IMPACTS BY CLIMATE SCENARIO

	Existing	Expected	Extreme
Average annual total precipitation	41"	43"	45"
Maximum period of consecutive wet days	16-21 days	16-21 days	15-23 days
Annual days with total precipitation > 1 inch	2-3 days	2-4 days	3–6 days
Potential Properties Da	amaged by	Storms	
Buildings Located	in 100-year Floodplain	5	8

Total Value of Structures Potentially
Damaged by 100-yr. Flood

\$2.2 billion

Sources: NOAA,CMRA Assessment Tool, National Climate Assessment LOCA data, 2018.

Floodprone areas in Village of Lancaster

100-year floodplain (1% annual chance)

> 500-year floodplain (0.2% annual chance)



Sources: FEMA Floodplains



Western New York is projected to experience an increase in severe winter storms. In the Village's 2020 vulnerability assessment, snow accumulation was addressed as a concern due to some older municipality buildings needing their roofs repaired to handle increased snow accumulation.

Although projections do not show a reduction in winter precipitation across Erie County, as winters become warmer it is expected to see more heavy rain events than snow events in early winter, and when it does snow, it will be more intense and occur over a shorter period of time.¹⁴

Recent winter storms that affected the Village of Lancaster include "Snowvember" (Nov. 17-18, 2014) and the 2022 Blizzard from December 22nd-26th. Although it only lasted two days, more than 60 inches of snow fell on Lancaster during the November 2014 winter storm. During the 2022 Blizzard, the blizzard consisted of top wind gusts at 79 mph (equivalent wind speeds as in a category 1 hurricane) and up to 50 inches of snow fell across the county. The Blizzard had three storms in one: a lake-effect snowstorm, a windstorm, and an ice storm. The blizzard's total snow accumulation accounted for 80% of the total snow for 2022 in the greater Buffalo area, marking the region's third-snowiest December on record.

WINTER WEATHER IMPACTS BY CLIMATE SCENARIO

	"Existing"	"Expected"	"Extreme"
Total annual snowfall (in)	95"	113"	86"
Days with maximum temperatures below 32 °F	44-51 days	8-38 days	4-26 days

Projected Average Annual Lake Effect Snowfall (inches) through 21st Century Compared to Observed Trend



Sources: U. .S. Global Change Research Program, CMRA Assessment Tool using National Climate Assessment LOCA data, 2018. Accessed July 2023 at resilience.climate.gov/ Notaro, Bennington, and Vavrus, "Dynamically Downscaled Projections of Lake-Effect Snow in the Great Lakes Basin," 2014; Vermette, "Weathering Change in WNY: Climatic Trend Analysis (1965-2016)," 2017.

Extreme weather events put huge pressure on emergency services and critical infrastructure. As was illustrated with the 2022 Blizzard, if not properly prepared, the community may be left without power or emergency aid, which may result in preventable deaths among vulnerable community members. The Village of Lancaster sees severe winter storms as a high risk, but with a strong ability to adapt to it based on existing infrastructure in place. Therefore, providing correct protocols and measures are put in place with sufficient time for residents to prepare, community members won't have to face the worst consequences associated with this climate hazard.



This plan focuses on climate hazards identified to be of highest concern in the Village, but also acknowledges a variety of other potential climate impacts that may require attention to achieve climate resilience.

High winds may become more common and severe as global climate patterns shift. An analysis of climate trends found that the number of "thunderstorm" wind events over Lake Erie increased significantly from 1996 to 2016.¹⁵ The community survey shows that severe wind is a common concern for the community and warrants mitigation planning and action. Survey respondents reported damage to their homes and businesses from heavy winds and fallen trees. One resident noted that West Main Street, where their home is located, experiences particularly harsh winds. Other residents shared experiences of losing siding, shingles or fencing from their homes due to heavy winds.

Air quality concerns could become more persistent due to climate change impacts. A recent study found that after decades of progress, air quality hazards are increasing in the US.¹⁶ Lancaster experienced a number of days with unhealthy air quality in 2023 due to smoke from wildfires in northern Canada. These events present health concerns for the community, especially for children, seniors and those with chronic health conditions, and could have wider impacts in the future.

Invasive species may become an increasing concern in WNY as non-native species adjust to new climate conditions and spread throughout the region. Invasive plant species, pest insects, blights and parasites can threaten native species and ecosystems, which may cause harm to the Village's tree inventory and natural areas. Invasive species were identified as a priority for action by 19% of community members who responded to the survey.







Climate Vulnerabilities

Social

The populations in the Village of Lancaster that will be most at risk from the impacts of climate change include **youth and seniors**. These groups of people make up nearly 40% of the Village's population, and are **more susceptible to heat illness during extreme heat events**. These populations may also have limited mobility options during extreme weather events, if temporary relocation or sheltering is necessary.

The Village has also has 5.5% of its residents with income below the poverty line. This population may have fewer financial or household resources to prepare for hazard impacts, thus it will be **important to ensure adequate access to services for the Village's most vulnerable**.

Chosen **resilience strategies must consider these vulnerable populations** so everyone is considered while planning for emergency situations. This will require assessing where various amenities would be most useful before a storm or heat wave. Ensuring that households with young children or seniors are made aware of how they can stay safe and healthy in the event of an extreme weather event should be prioritized.

Additionally, the **housing stock** in the Village of Lancaster **is significantly older** than in other neighboring municipalities. In fact, the Village of **Lancaster has 39% of homes built before 1940**, and only 2% built after 2000, as reported in the Joint Comprehensive Plan (2018). It is more likely for older homes to lack central air conditioning - a utility the UN declared a human right in 2022 - as extreme heat events continue to be more common.

Economic

From 1999-2017, **climate-related and geophysical disasters cost \$2.9 trillion globally,** a sign that climate change induced events come with a hefty financial burden¹⁷. It is important that municipalities mitigate these impacts prior to disaster events in order to avoid the worst of these costs. The cost associated with implementing different resilience strategies varies greatly, and some are undeniably expensive, yet it is important to remember that having no strategy in place is more costly in the long-run from a climate-related perspective.

According to the Erie County Hazard Mitigation Plan (2022), the estimated damage to the Village of Lancaster's building stock from 100year floods (floods that have a 1% chance of occurring annually) would cost **\$2.2 billion** for total replacement. The frequency of these events is increasing due to climate change. In addition to risks to building stock, flooding poses an economic threat from associated tax loss, impacts to utilities and infrastructure, increased insurance costs, business interruption, and impacts on tourism. Debris removal after floods can be costly and resource-intensive as well. It is estimated that a 100-year flood event would produce nearly 4,000 tons of debris in the Village of Lancaster.¹⁸

Severe winter storms also pose a threat to the Village of Lancaster's building stock. **The cost of a replacement of only 1% of the Village's building stock due to storm damage would be over \$22 billion.**¹⁹ Typical damage from severe winter storms includes damage to roofs and door frames from the weight and impact of heavy snowfall, especially when combined with high winds.

Infastructure

The Village of Lancaster has a variety of critical infrastructure that needs to be considered for climate resiliency. Although the bulk of Village owned infrastructure includes Village Facilities (DPW, Village Hall, Fire Stations), there are other **critical assets in the Village that are not owned by the Village**.

Some examples of these are the several bridges and roads that provide access into and out of the Village, which are owned by New York State or Erie County. New York State Electric and Gas (NYSEG) owns and operates an **electrical sub**station near downtown Lancaster, and there are several **rail lines** that cross Central Avenue and dominate the Village's northern landscape that are not owned by the Village. Although the Village does not own or maintain this infrastructure, they are crucial for the Village's ability to respond in the event of a climate crisis. Coordinating planning and response strategies with other muncipalities will be important to maintaining the Village's ability to respond to an extreme event.

The Village's 2020 Vulnerability Assessment also identified some opportunities to improve existing conditions at **Village Hall and the DPW Campus.** This includes roof stabilization and replacement at the "Steel Barn" that if not addressed could result in collapse during a major snow event. This type of damage has the potential to reduce Public Work's ability to respond to an extreme event, and could result in loss of life and property in the worst case scenario.

Village Hall was also noted as having drainage issues that could result in flooding at the facility during a major rainfall or snow melt event. Flooding at Village Hall could result in mold or indoor air contamination that has the potential to harm workers and residents that may need to seek shelter during extreme heat or snowfall events. Addressing these issues at Village Facilities should be prioritized to ensure the Village is capable of providing adequate support for residents and workers in the case of an extreme event.

It was noted by stakeholders that the **Village of Lancaster has been the hub for first responders for the Town of Lancaster** during previous extreme weather events; therefore, efforts to protect Village infrastructure will have an impact beyond the Village's boundaries, as well.



Identifying Priorities for Climate Resilience

Climate Scenario Workshops

The Village hosted scenario planning workshops with internal stakeholders (Village staff, elected leaders, and volunteer committee members) and youth in order to gain insights about the hazards and vulnerabilities that are of greatest concern to community members and to identify priorities for building resilience in the future.

Stakeholders were presented with **projected climate scenarios for the mid-21st century** along with various **approaches to developing resilience thatcould help the Village prepare** for such events.²⁰ The scenarios (summarized below) were presented by the planning team, and participants were asked to identify the resilience approaches they deemed most effective for addressing the hazards associated with each scenario. The feedback from these workshops is included on pages 30-35.



Extreme Heat Scenario

In Summer 2050, the Village of Lancaster is in the midst of a record-setting heatwave. There have been 9 consecutive days with high temperatures exceeding 90 degrees (F), and the Village recorded its first ever day over 100 degrees.

Demand for electricity is at an all-time high, leading to rolling brownouts and intermittent power outages; during these times many residents are unable to cool their homes and businesses. Numerous reports of heatrelated illness have been reported and cooling shelters are working at maximum capacity.



Flooding Scenario

In April of 2055, heavy rains have soak the Village of Lancaster over 13 consecutive days. Two of these days have totaled over 1.0 inch of precipitation within 24 hours, exceeding the 99th percentile for daily precipitation levels.

The rains are creating flooding conditions throughout the Village. Water levels in Cayuga and Plum Bottom Creeks are at historic levels, overflowing culverts and threatening to wash out bridges. Many homes, businesses, and public buildings have been damaged by the flooding, and some roads are impassable to vehicles, making emergency operations all the more difficult.



Severe Winter Weather Scenario

In January of 2053, a historic lake effect snow event blankets Western New York with several feet of dense, heavy snow. Temperatures plummet and sustained heavy winds cause damage to trees, buildings, and vehicles. Several neighborhoods lose electricity for 2 or more days.

After the storm passes, temperatures quickly rise leading to rapid snowmelt and flooding of streets and buildings. Soon after clean-up has started, a second storm starts up. Streets become icy, and there are numerous reports of people stranded in vehicles or stuck in their homes due to drifting snow. Nine potential approaches to building resilience at a local level were presented to workshop participants. These nine approaches, listed below, were developed by the planning team through a review of past plans and literature on climate adaptation. In general, the potential approaches fall into actions related to infrastructure improvements and others that deal with planning and policy interventions.

These approaches are general and capable of addressing the impacts of multiple climate hazards. Implementation of these approaches could involve various kinds of projects, programs, or policies. In this way the potential approaches can be customized to address local conditions and specific challenges.



for building Climate Resilience

Dedicated climate adaptation funds	Allocate funding obtained through taxes, fees, or cost savings to support local climate adaptation actions.
Improved gray stormwater infrastructure	Upgrade sewer and stormwater infrastructure and other engineered systems to mitigate flooding, reduce runoff, and improve water quality.
Green infrastructure/design	Utilize nature and nature-based solutions on public and private property to mitigate flooding and extreme heat.
Enhanced emergency operations	Ensure emergency operations and systems are up-to- date and people are well-informed about resources and protocols during hazard events.
Sustainable development/land conservation	Integrate climate risk into planning, urban design, and development; employ zoning and land use controls to protect wetlands and natural spaces to enhance resilience.
Climate education/outreach	Increase public awareness of changing climate impacts and build support through community education; provide training for city staff and first responders.
Structural upgrades for hazard mitigation	Upgrade buildings and infrastructure to keep occupants safe and comfortable and minimize damages during flooding and other hazard events hazards.
Climate-resilient construction material	Utilize sustainable materials that reflect solar energy to minimize heat island impacts and allow water to permeate the ground to reduce stormwater runoff.
Invasive species management	Ensure that ecosystems are protected from invasive species that can have widespread impacts.

Identifying Priorities for Climate Resilience



Issues related to extreme heat stem from burning of fossil fuels, and the resulting emissions, known as greenhouse gases, which trap heat in the atmosphere. Increased atmospheric temperatures can be compounded by 'heat islands' in developed areas where solar heat is absorbed by, and radiates from, buildings and paved surfaces, resulting in higher measured surface temperatures, as shown on this map. Tree planting and nature-based solutions were identified by Village stakeholders as strategic ways to address extreme heat in the Village of Lancaster.

Stakeholders identified places throughout the Village that could serve as Cooling Centers for vulnerable residents, and discussed where backup power would most be needed in case of blackout and brownouts. particularly to keep municipal services running in the case of power outages. Working with the local electric utility, NYSEG, to include energy storage at the sub-station in the Village could also help preserve power for the entire Village, allowing residents with air conditioning to shelter in place or provide refuge for neighbors in need during high heat events.

Public outreach and education to help residents prepare and understand existing resources should be an important part of the Village's overall resilience strategy.



What were the areas of concern for Extreme Heat?

1	Lancaster Towers - a 9 story building with 158 units of affordable housing for seniors. Maintaining air conditioning and electricity to operate elevators will be critical during periods of high heat.			
2	Group Homes and Nursing Homes - a variety of large and small facilities for seniors or people with disabilities who may be vulnerable to heat-related illness.			
3	Schools - school children may be vulnerable to heat-related illness; schools may also be natural places to be equipped as cooling centers/resilience hubs.			
4	NYSEG Electrical substation - ensuring that this infrastructure can remain operational during high heat will protect the village's power supply.			
5	Heat Islands in residential areas - more paved/impermeable surface causes higher temperatures in localized areas.			
6	Damaged tree canopy - loss of street trees also leads to higher ground temperatures in the surrounding areas.			
Identified Assets for Resilience				
A	Fire halls - may serve as cooling centers/ resilience hubs during high heat events.			

Senior Center & Youth Bureau - public buildings that could be equipped as cooling centers though collaboration with the Town of Lancaster.

Keysa Park Pool - a resource for residents seeking to cool off during extreme heat, if coordinated with the Town of Lancaster.

C

Top resilency approaches recommended by...



...community members

...internal Stakeholders

Enhanced emergency operations Cooling centers may also serve as resilience resource hubs.



Extreme heat may be a "new" phenomenon for some residents.

Climate-resilient construction material

Reflective roofs and walls can help buildings stay cooler.

Green Infrastructure/design

Planting trees is cost-effective and provides additional benefits.



Identifying Priorities for Climate Resilience



The Village of Lancaster has a history of dealing with localized flooding. Stakeholder concerns focused on areas with a history of past flooding incidents, and many community members mentioned the need for household flood-control measures, including sump pumps, throughout the Village.

Neighborhoods near Como Lake Park, Cayuga Creek and Plum Bottom Creek were identified as the most vulnerable areas of the Village for flooding. It will be important for the Village to continue to take measures to mitigate flooding near these waterways, as critical infrastructure such as bridges, roads, rail corridors, County stormwater assets, the Village's DPW, and residential housing are all located in the FEMA recognized flood zones.

There have been numerous projects recently completed or funded that will address flooding in the Village, however upstream development of natural lands for housing may exacerbate flooding in the Village and other downstream communities in the watershed, suggesting the need for coordinated planning with other municipalities within the creeks' watersheds.



What were the areas of concern for Flooding?

Cayuga Creek at Lake Avenue and along the north edge of Como Lake Park - the most flood-prone area in the Village of Lancaster, including significant flooding in 2017. Dredging of the creek is required periodically to remove sediment carried by upstream runoff.

2

The neighborhood south of Cayuga Creek between Brunswick and Aurora St. is prone to flooding. Parts of this neighborhood may lie within the floodplain when FEMA maps are re-drawn.



Lancaster DPW and an Erie County wastewater pumping facility are located in close proximity to a flood-prone areas.

Any new development along Brookfield Place may contend with future flooding issues as it is close to the 100 yr floodplain boundary.

The area between Holland Ave. and School St. is also vulnerable to flooding from Plum Bottom Creek during heavy precipitation events.

Conrail/Erie - Lackawanna Railroad - crosses the Plum Bottom Creek floodplain; operations may be impacted by future flooding events.

Identified Assets for Resilience



6

New culvert installed along Plum Bottom Creek to manage flow in the village's downtown.



Green Infrastructure projects have been installed at various locations, including Pleasant Avenue, to assist with stormwater absorption.

Top resilency approaches recommended by...



...community members

...internal Stakeholders

Structural Upgrades for Hazard Mitigation (Flood-Proofing) The DPW facility on Broadway was noted as Priority #1 for flood protection.



Improved "gray" stormwater infrastructure

Incremental upgrades to the sewer system and engineered flood prevention near creeks.

Green Infrastructure & Design

Use natural areas and nature-based designs to absorb stormwater.



Enhanced Emergency Operations

Planning for flood events and potential evacuation is increasingly important.





The winter storm scenario discussed in the workshops bore similarities to a storm the Village experienced in recent years. Stakeholders recalled being the epicenter of heavy snow events, and quickly becoming the hub for first responders in the region. Power outages and transportation issues were some of the highest priorities for many of the stakeholders.

Having safe access to seniors and vulnerable residents that may live in older housing stock or rely on medical equipment for their survival was top of mind. Clearing routes to local warming shelters or providing access to health care facilities should be prioritized during such events. It is also important to provide adequate advanced warning to help residents and first responders better prepare for extreme weather events.

Climate education and outreach may be the most effective way to help Village residents and employees prepare for these extreme events. Preparing homes with survival kits and emergency plans, knowing the available resources and which residents may need them, and having adequate communications networks are all critical to building community resilience to extreme winter weather.

Extreme weather events also have the potential to include localized flooding as snow melts. Considerations for flooding should also be applied to winter weather preparedness.



What were the areas of concern for Severe Winter Weather?

1

DPW Building - snowplows and other heavy equipment kept here are key to the Village's response to major snow and winter weather events. Keeping snow from piling up around ground-level HVAC units was identified as an important task.

Lancaster Volunteer Ambulance Company - vital to the Village's emergency response.



NYSEG Electrical Substation - power lines near this station may be vulnerable to high winds.



Lancaster Towers (senior housing) - high priority site for emergency response



Local schools and preschool

Identified Assets for Resilience

DPW - a potential warming shelter. To date, the Village has not established warming shelter/resilience hub sites for extreme cold/"Code Blue" events.

Public Library - a potential warming shelter location

Fire Stations - potential warming shelter locations

Top resilency approaches recommended by...



...community members

...internal Stakeholders

Enhanced Emergency Operations

Establishing and equipping warming shelters at community sites.



Climate Education & Outreach

Promote household preparation for winter weather events and the resources available to residents.



Funds should be prioritized for lower-income and vulnerable households.

Improve "Grey" Storm Water Infrastructure



Improvements to stormwater drainage systems will reduce flooding from snowmelt.

Recommended Strategies for Climate Resilience

The recommended strategies described in this section identify **steps that can be taken to enhance climate resilience in the Village of Lancaster**, with **important roles for both community members and the village government.** These recommendations were developed through the synthesis of scientific research on future climate impacts, assessment of local conditions, and feedback from community residents and stakeholders about the resiliency approaches that were presented.

Feedback from the internal stakeholder group tended to focus on village operations, infrastructure and long-term development, while community members focused more on quality of life issues; however, the resilience strategies selected by each group show remarkable overlap for all of the scenarios discussed (see pp. 31, 33, 35).

The prioritization of resilience strategies by community survey respondents was more general, as the survey did not break down choices by hazard type. The top-priority strategies among survey respondents were focused on **land use decisions** (protecting natural areas, avoiding development in hazardprone areas) and **maintaining/upgrading traditional infrastructure**, with less focus on new programming or protocols for adapting to climate impacts. Stakeholders identified several of the resilience approaches as **cross-cutting priorities** for all climate adaptation action that the Village may take on. These include:

- Climate education and outreach can bolster awareness of available resources, help to dispel misinformation, and improve household preparedness for climate hazards.
- Enhanced emergency operations evolving climate hazards will require new methods and technologies to be employed by municipalities to manage emergencies.
- Dedicated climate adaptation funding diverse and innovative modes of funding are needed to ensure sustained progress and avoid competing with other priority areas for public funds. Potential funding sources for each of the recommended strategies are identified on page 45.

In the following section, each recommended strategy is described in terms of how it could contribute to climate resilience in the Village of Lancaster. The "**How This Strategy Performs**" matrix accompanying each recommendation provides information on the relative **resilience benefit, costliness, and complexity of implementing the strategy**²¹, followed by ideas for local implementation to address specific hazards.

Enhance emergency operations for extreme weather events

Extreme weather events have prompted municipalities to enhance their emergency operations. This can entail **targeted communication to inform the public** on emergency procedures, **early-warning systems** and protocols, and ensuring adequate emergency preparation and **back-up power at emergency shelters and critical facilities.**

Given its **applicability across all hazard types** and its importance for effective emergency response, this strategy was **the most popular choice among community and internal stakeholders**. The Village of Lancaster also serves as the center of operations for the Town of Lancaster's emergency response; thus **ensuring that the Village's public infrastructure** and the transportation network **can function during and after extreme weather events is of high importance**.

How this Strategy Performs

HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Establish a "Code Red" system for to notify residents of extreme heat events and the resources available to mitigate heat-related risks.
- Establish cooling shelters at public facilities; utilize these sites to provide information and resources for making homes more efficient and comfortable.
- Provide support to facilities providing housing to vulnerable populations to ensure back-up power is in place and residents can be kept safe during extreme weather event.



- Update flood evacuation protocols and provide targeted communications about them to residents who live in the most flood-prone neighborhoods.
- Coordinate planning for future flooding events with other communities within the Cayuga Creek watershed. Engage non-profit partners with expertise in this area, such as Buffalo Niagara Waterkeeper, to review plans.



Severe Winter Weather

- Ensure emergency protocols prioritize first responder and DPW facilities to ensure emergency services can access roads.
- Develop emergency plans & protocols in collaboration with Town of Lancaster, Village of Depew, and Erie County.
- Designate and equip public facilities, such as schools, to serve as emergency shelters during extreme cold events. Coordinate with OEM to request supplies in advance.
- Enforce Village's winter parking ban on streets to ensure roads can be plowed during heavy snow events.

Bolster climate awareness and household hazard preparedness through education and outreach

Climate education and outreach helps communities adapt to climate hazards **by increasing knowledge of potential impacts at the local level,** motivating residents to **prepare their homes** for extreme weather events, and **connecting them with resources** to help with these preparations.

Outreach and education can be accomplished through creative methods and tailored to local needs and interests; it may include **special events, targeted media campaigns, workshops or trainings, surveys to gather information from residents, and other means of public engagement.** These efforts require considerable planning and coordination, and have varying costs depending on scale; however they can be a relatively straight-forward way to build buy-in for efforts to build climate resilience and other sustainability initiatives at the local level.

HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Provide information through print and social media and local news sources about heat-related health threats, locations of cooling centers, and resources for cooling homes and neighborhoods.
- Encourage renewable energy sources and energy storage among households and local businesses to minimize the demand on the local electrical grid during high heat days.



- Target education and outreach to households located within flood-prone areas near Cayuga and Plum Bottom Creeks. Provide tips or starter kits to encourage households to plan for and put together emergency supplies for flooding events.
- Provide education throughout the community on household preparedness for flooding and other weather-related emergency events, the Village's evacuation routes, and the location of areas of refuge if evacuation orders are given.



Severe Winter Weather

- Provide education to community members regarding household preparation for extreme weather events, including the supplies to have on hand and plans for if heat or electrical power is lost. Consider providing simple emergency kits to households and educating K-12 students about household preparedness.
- Provide information to home and business owners about practical steps to protect their properties from damage during severe weather events.

Promote sustainable development and protect natural areas through land use regulations

Municipal land use regulations can support climate resilience **by preserving natural areas**, which provide environmental services, and encouraging development in suitable locations at appropriate densities. **Zoning codes can designate areas for conservation**, and can be complemented by building and infrastructure codes that integrate sustainable development goals in construction materials and operations. Due to the many stakeholders impacted by land use decisions, land use **regulations can be procedurally complex to implement, but the potential benefit for climate resilience is high**.

The priorities for resilience among **community survey respondents focused on this category**, highlighting the desire to avoid problems, when possible, by **restricting development in hazard prone areas and maintaining the benefits of greenspaces and natural areas**.



HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Promote compact development downtown and along commercial corridors through in-fill development and adaptive re-use of existing buildings, prioritizing energy efficiency and modernized HVAC systems; facilitate building reuse through financial incentives and technical assistance for developers or business owners.
- Develop infrastructure for walking and biking (such as sidewalks, bike lanes, and lighting) within the Village and connecting downtown to commercial areas and important community locations to allow for safe and expedient mobility during extreme heat events and reduce the need for car travel.
- Capitalize on new public transit routes by planning for development in areas near transit stops.



- Revise zoning code to minimize new development in flood-prone areas or natural areas that provide important environmental services, such as flood control.
- Consider building permit requirements that would require infrastructure improvements (especially sewer) as part of new developments.
- Identify properties with natural land cover that have strategic value for reducing stormwater runoff and provide incentives for conservation of natural land. Add new public parks when possible.

Upgrade stormwater & sewer systems to mitigate flooding

As extreme precipitation events become more common, improvements to "gray" stormwater infrastructure can help municipalities **reduce stormwater runoff, flooding, and degraded water quality**. Replacing older sewer lines and stormwater systems can provide considerable longterm benefits for managing flooding, though improvements on this level are inevitably **costly and involve complex engineering** and in-depth stakeholder engagement.

Other measures may be more cost-effective, such as pumping **station upgrades, green infrastructure**, or artificial barriers and reservoirs **to impede stormwater runoff**.

Sewer and stormwater system upgrade projects to manage flooding from local creeks were **identified by all of the stakeholder groups as a high-priority** for the Village of Lancaster, given on-going flood concerns.



HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Flooding

- Develop a plan to determine sections of sewer or stormwater infrastructure that need to be replaced or repaired over time. Identify and prioritize areas of highest flooding concern or where drainage infrastructure is inadequate to handle the current flow of stormwater for replacement when funding is available.
- Prioritize flood management infrastructure near Plum Bottom Creek in the eastern part of the Village, which has the lowest elevation and may be more prone to flooding.
- Identify green infrastructure or engineered solutions that can help to divert or retain stormwater to minimize flood pressures on the existing system.
- Encourage residents to disconnect gutter downspouts from the sewer system.



• Identify areas where rapid snowmelt or ice jams may contribute to local flooding or problems with stormwater management and incorporate these areas into the list of sewer/stormwater system sections that are prioritized for upgrades.

How this Strategy

Benefit

Infrastructure

Complexity

Cost

Performs

Climate Resilience Strategy:

Promote green infrastructure on public and private property

Green infrastructure involves using materials, technology and design elements to **emulate and maintain the function of natural systems**, reducing the impact of climate hazards like flooding and extreme heat. Green infrastructure for flood control includes **bioswales**, **rain gardens**, **green street design**, **or pavement removal**. Heat island impacts can be reduced by using **green roofs** & walls, **urban forestry**, **and green design**.

Implementing this strategy can be costly, but **saves costs in other areas**, such as avoiding expensive sewer infrastructure replacements and reducing energy use by **cooling buildings**. It can also enhance the visual appeal of urban areas

The Village of Lancaster has successfully integrated green infrastructure at Cayuga Creek Park, and manages a treeplanting program to enhance the Village's tree canopy.

HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Continue and expand tree planting programs along residential streets, commercial areas, and public spaces to increase areas with natural shade and tree diversity within the Village. Tree planting efforts should be aligned with areas where higher heat island effects have been recorded.
- Develop an educational campaign to involve residents and students in tree planting and tree care on their properties, including information on selecting species of trees and other plants that support biodiversity and climate resilience.
- Provide low- or no-cost tree saplings and native plants to residents to encourage climate-resilient landscaping practices.



- Include requirements for green infrastructure, such as bioswales and rain gardens, in site plans for new development that will increase impervious surface on a site.
- Encourage residents to disconnect gutter downspouts from the stormwater system by incentivizing rain-barrel connections.
- Organize green infrastructure demonstration projects and develop educational resources to inform residents and business owners about the rationale for these projects.
- Provide educational material and host workshops to encourage residents to install rain gardens.



low

high

Help property owners upgrade structures to mitigate hazards

Structural upgrades can **help buildings withstand extreme weather events** including winter weather, flooding, and high heat, while also **protecting the occupants** from the impacts of these events. **Increased energy efficiency** in buildings that leverage renewable energy and energy storage **allow buildings to maintain indoor temperatures** while providing reliable energy and backup power for residents. This **reduces exposure for residents and can enhance public safety**.

Although, this strategy relies heavily on engineering solutions, which may be complex and costly to implement, it is likely to save lives and costs related to natural disaster recovery.²²

Other examples could include modular construction, temporary or movable **features that protect from flood infiltration or extreme heat**, and improved drainage.

HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Provide information about existing programs that assist low- to moderateincome households and local businesses to take advantage of incentives for energy-efficiency upgrades and weatherization at their properties.
- Pursue and allocate dedicated funding such as Community Development Block Grants (CDBG) for home improvements to assist with climate adaptation, such as home energy efficiency, air conditioning, backup power, and renewable energy resources.



- Revise building codes to make flood mitigation practices and materials, such as drainage systems and freeboarding, standard practice for new construction or large-scale rehab projects in flood-prone areas.
- Provide a local demonstration of flood-proofing on a public or private building within a flood-prone area along with information about how to implement flood-proofing for home and business owners.
- Require that new or rehabbed homes in flood prone areas be equipped with sump pumps.
- Adjust zoning maps as new floodplain maps are released to discourage development in flood-prone areas.



Severe Winter Weather

- Provide Information about existing programs that promote home energy upgrades, such as insulation, HVAC systems, and other energy efficiency measures.
- Identify existing programs to assist low- to medium-income households to equip their homes with back-up power.
- Ensure that heating systems at public facilities are adequately vented to protect from being affected by drifting snow. Provide information to the pubic about adequate ventalation for heating systems during severe weather events.
- Explore how micro-grid systems using renewable energy and energy storage could help provide back-up power during outages.





Increase the use of climate-resilient building materials

Climate-resilient construction materials can enhance resilience to climate hazards for buildings and neighborhoods. **Sustainable and lighter-colored materials and building exteriors can mitigate extreme heat effects and reduce stormwater runoff.**

Examples of climate resilient construction materials are white roofs and walls to reflect solar heat and "cool" and permeable pavements. Using climate-resilient materials in new construction and renovation projects provides a relatively high benefit at moderate or low costs; as such, the projects are generally fairly simple in terms of the administrative effort and infrastructure required.

Local building codes can be updated to require or encourage the use of more sustainable and resilient building materials.



HOW COULD THIS BE IMPLEMENTED IN THE VILLAGE OF LANCASTER?



Extreme Heat

- Amend building codes to require or encourage the use of white/reflective coatings or materials on roofs and walls over a specified size.
- Identify funding (grants or low-cost loans) to assist property-owners in retro-fitting buildings with climate-resilient building materials such as reflective paint or roofing materials.
- Install reflective roof coating on one or more Village-owned buildings and share photos and energy savings info with the public to demonstrate positive impacts. Host events at which contractors and business owners can learn about reflective roofing materials and installation.



- Amend building codes to require or encourage the use of permeable or "cool" pavements on building sites that exceed a threshold of impervious surface area.
- Create a demonstration project by installing permeable or "cool" pavement at a public facility and sharing information with the public about how it performs differently than traditional pavements.

Recommended **Climate Resilience Strategies** at a glance

Strategy	The Risk/ Opportunity	Strategy Description	Implementation Leads	
Enhance emergency operations for extreme weather events	Village emergency operations must adapt to changing hazards like extreme heat.	Continue to enhance local emergency operations and communications from the Village and adapt these systems to changing climate hazards.	Village government, Police, Fire, and Office of Emergency Management (OEM) working with all Village departments	
Bolster climate awareness and household preparedness through outreach and education	Prepare households to manage climate hazards and build support for climate action.	Make households more aware and prepared for climate hazards through strategic education and outreach, technical assistance, and funding.	Village government, Fire Dept., OEM, DPW, Water, Schools, Library, Youth Dept., Senior Citizens	
Promote sustainable development and protect natural areas through land use regulations	Development could overextend Village infra-structure and threaten natural areas that suport hazard mitigation and climate resilience.	Use land use planning, policies, zoning, and other incentives to encourage development in previously developed areas to conserve and enhance natural areas, limit new infrastructure needs, and mitigate hazards.	Village government, Planning and Zoning Boards, Community non profits, Conservation organizations, NY State	
Upgrade stormwater and sewer systems to mitigate flooding	Aging sewer & stormwater infrastructure can contribute to flooding problems.	Continue to make cohesive, strategic efforts to maintain, update, and enhance the sewer system to prepare to handle more extreme precipitation events.	Village government, DPW, Engineering, Water, WNY Stormwater Coalition	
Promote green infrastructure on public and private property	Green infrastructure is a cost-effective but underutilized measure to mitigage flooding and other hazards.	Expand the use of green infrastructure in public places and on residential and commercial properties through strategic planning, education and outreach, technical assistance, funding, and incentives.	Village government, DPW Engineering, Property owners, Consultant(s), Planning and Zoning Boards	
Help property owners upgrade structures to mitigate hazards	Older homes and buildings can increase hazard risks for community members.	Provide homeowners with financing, funding, technical assistance, and other supports to encourage improvements to energy efficiency and flood resistance.	Village government, DPW Engineering, Building Inspector, Property owners, Consultant(s)	
Increase the use of climate-resilient building materials	New construction and rehabilitation projects can employ advanced building materials to manage heat and extreme weather.	Provide building owners, developers, and homebuilders with incentives and technical assistance to utilize building materials that will reduce heat island effects, protect from flooding, and minimze other impacts related to extreme weather.	Village government, DPW Engineering, Building Inspector, Property owners, Consultant(s)	

Ways to Implement

Funding Options

 Emergency notification system to inform/prepare public for hazards. Ensure all Village buildings and schools are properly equipped to serve as emergency shelters during extreme heat and cold. Purchase vehicles for Village departments to enable first responders to travel in extreme snowfall events. Coordinate emergency plans with nearby municipalities, Erie County, and State agencies. Require or incentivize backup power generator capability for critical services. 	FEMA Preparedness Grants, FEMA/NYS Department of Homeland Security and Emergency Services, Building Resilient Infrastructure and Communities
 Community outreach and education to promote awareness and preparedness. Distribute emergency supplies & resources to enable residents to shelter in place. Support community groups to assist in hazard response/recovery, especially vulnerable populations (e.g., distributing food/supplies via snowmobiles). Partner with nearby municipalities, County or State to implement/fund strategy. 	US EPA Environmental Justice Small Grants (EJSG) and Greening America's Communities; FEMA Preparedness Grants and Building Resilient Infrastructure and Communities; NYS DEC Climate Smart Communities
 Adapt zoning and engage with conservation non-profits to protect wetlands and other designated natural areas. Investigate other land use policies to limit flooding and preserve wetlands, tree cover, parks, and other open spaces. Promote adaptive reuse of existing buildings through financial incentives. Use zoning to encourage development in areas connected to existing sewers. Limit new development outside of existing sewer system, or require system upgrades as part of any new development that utilizes sewer system. 	NYS DEC, Freshwater Wetlands Program; NYS Environmental Protection Fund Grants; National Fish and Wildlife Foundation, Acres for America; US EPA Wetlands Protection Development Grants; US EPA and NYS DEC Brownfields Program Grant Funding; NY Main Street Program
 Remove residential stormwater from entering the sanitary sewer system. Redesign and right-size the sewer infrastructure where necessary. Procure State and Federal funds and other funding sources for system improvements. Develop a strategic plan to determine how to most efficiently carry out additional sewer projects through phased implementation to address the most critical infrastructure needs and capitalize on available funds. 	US EPA, Sewer Overflow and Stormwater Reuse Grants; NYS Environmental Facilities Corporation, Water Infrastructure Improvement Act; Northern Border Regional Commission, State Economic & Infrastructure Development Investment Program, Inflation Reduction Act
 Incorporate strategic plans for green infrastructure (GI) in comprehensive plan. Update zoning codes to promote GI use for neighborhoods and Village. Adapt Villagewide tree inventory for increased diversity and climate resilience. Demonstration projects for GI with public education components for residences, businesses, and public spaces, and other education on GI practices/ opportunities. Promote GI for residents and businesses through new incentives, funds or credits, including rain barrel and rain garden programs. Monitoring and outreach to maintain GI practices on private lands. 	NYS Environmental Facilities Corporation, Green Innovation Grants; US EPA Great Lakes Restoration Initiative; US EPA Green Streets, Jobs, Towns (G3) Grants; NYS DEC Urban and Community Forestry Grants
 Provide technical and financial assistance to promote home energy-saving improvements such as insulation, and other energy efficiency measures. Procure and allocate Village dedicated funds for climate adaptations and home improvements, such as air conditioning, back up power and renewable energy. Ensure energy efficiency and hazard mitigation measures for new construction. Install demonstration projects on Village properties. 	NYSERDA Home Energy Efficiency/ Performance Programs; US Dept. of Energy, Energy Efficiency and Conservation Block Grant Program; HUD, USACE Floodplain Management Services (FPMS) Program, Tax credits/ abatements, Inflation Reduction Act
 Revise building codes to require/encourage the use of climate-resilient building materials to manage heat and flooding impacts. Secure and implement funding (grants, low interest loans) to assist property owners in retrofitting their homes and businesses. Provide education through outreach, technical assistance programs, and demonstration projects at public buildings. 	NYSERDA Regional Clean Energy Hubs; NYSERDA Clean Green Schools Initiative; US Dept. of Energy, Energy Efficiency and Conservation Block Grant Program; HUD, Tax credits/abatements, Inflation Reduction Act

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Moving Forward

AN EVOLVING PROCESS

This document provides a starting point for an ongoing process to promote climate resilience in the Village of Lancaster that involves continual review and revision. The resilience strategies that the Village implements should be regularly monitored to track progress and results evaluated relative to the Village's resilience goals. Project results should be shared with the public and elected leaders.

The Village will need to reassess vulnerabilities periodically as the impacts of natural hazards on local conditions continues to evolve. Lessons learned can be applied to adapt resilience strategies and identify new approaches. This process will require continual engagement with the community's residents, businesses, organizations, and other stakeholders to ensure that new resilience strategies reflect the public's concerns and empower community-led climate action.

This plan and its recommended strategies are **intended to inform the Village's future planning processes,** including the Comprehensive Plan update, where the strategies included here can be refined and moved toward implementation.

COLLABORATION

The Village of Lancaster has already made meaningful progress toward building climate resiliency, due in part to the healthy cooperation between the elected leaders, community members, and key departments within the Village government. The ongoing work of the Climate Smart Communities Task Force, Forestry Advisory Board, and the Village's Sustainability Coordinator have been and will continue to be instrumental in moving the climate resilience strategies forward.

Collaboration with neighboring municipalities, Erie County, and New York State agencies (such as the Dept. of Environmental Conservation) will also be key to making measurable progress toward community resilience, especially in the area of flood management, and responding to extreme weather events.





CROSS-CUTTING STRATEGIES

Over the course of this plan's development, three of the resilience strategies were repeatedly identified as **over-arching strategies that should be prioritized** in order to **enable more specific and localized resilience projects**.

These cross-cutting strategies are:

- **Climate Education & Outreach** to build community buy-in for new initiatives.
- Enhanced Emergency Operations to protect residents and the community at-large at critical moments.
- Securing dedicated climate adaptation funding to provide for timely and flexible development of resilience projects.

Conclusion

The Village of Lancaster has demonstrated its commitment to leadership in the areas of sustainability and climate action. This plan represents another step in the Village's efforts to ensure the safety and well-being of its residents and stewardship of its natural environment in light of evolving climatic conditions. Implementing the plan's recommendations will involve the dedicated efforts of community members and stakeholders, in addition to the Village's government.

The **ability to secure funding** will have obvious implications for the scope and timeline of future climate resilience projects in the Village. Thanks to the planning that has already been done, the Village of Lancaster should be in a strong position to capitalize on State and federal funding opportunities.

Sustaining and amplifying the work of building climate resiliency today will help to **ensure that future generations of residents can experience life in the Village of Lancaster at its best for many years to come**.





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Data Sources and Notes

1. Pg. 8 - Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, WGI, Technical Summary; B.D. Santer et.al., "A search for human influences on the thermal structure of the atmosphere," 1996. Nature, 382; T. Westerhold et al., "An astronomically dated record of Earth's climate and its predictability over the last 66 million years," 2020. Science, 369.

2. Pg 14 - Britannica. "Seneca." (2024). https://www. britannica.com/topic/Seneca-people.

3. Pg. 14 - "Town of Lancaster, Village of Lancaster, Village of Depew Joint Comprehensive Plan." 2018. Prepared by Wendel, WWS Planning, and Larsen Engineers.

4. Pg. 15 - US Census, American Community Survey (ACS), 5-year estimates, 2022. Population comparison are based on population data from: "Town of Lancaster, Village of Lancaster, Village of Depew Joint Comprehensive Plan." 2018.

5. Pg. 15 - US Census, ACS, 5-year estimates, 2017-2022.

6. Pg 15 - US Census, Center for Economic Studies, Longitudinal Employment-Household Dynamics, Origin-Destination Employment Statistics, 2020. Accessed August, 2023 via https://onthemap.ces.census.gov/

7. Pg. 17 - Environmental Areas Table. Developed Area: USGS, National Land Cover Dataset, 2021. Represents the sum of all areas classified as developed (includes low, medium-, or high intensity development). Impervious surfaces: USGS, Impervious Surfaces, 2021. Impervious surface data provides the percent impervious cover for all areas in the US, at a resolution of 30m. This percentage cover is multiplied by the area of each pixel in the data (900m²) and divided by the total land area to determine the overall percent impervious cover in the City. Wetlands: NYSDEC Regulated Wetlands, National Wetlands Inventory 2023; Parks/Open Spaces and Vacant Land: Erie County Tax Parcel Data 2022; Trees; Village of Lancaster Tree Inventory 2019. 8. Pg. 18 - US Census, 2010 and 2020. https:// www.census.gov/quickfacts/fact/table/ lancastervillagenewyork,lancastertowneriecountynewyork/ PST045222#PST045222

9. Pg. 19 - (Critical Assets Map). Bridges: NYS Department of Transportation, 2021; Potential brownfields/chemical waste storage: NYS DEC, Chemical Bulk Storage Facilities program, 2023- designation applies to properties that store a hazardous substance that must be registered with DEC; All other Critical Assets (Hospitals, schools, police, fire, libraries, government buildings, wastewater treatment, and electric substations): Erie Co. Parcel Data, 2022. Extracted using property class codes.

10. Pg. 21 - Climate scenarios were developed using U.S. Global Change Research Program, Climate Mapping for Resilience and Adaptation (CMRA) Tool using National Climate Assessment LOCA data, 2018. Accessed November 2023 at resilience.climate.gov/

11. Pg 23 - Village of Lancaster Extreme Weather Vulnerability Assessment. 2020. Prepared by C&S Companies. Also, data regarding precipitation and storm surges was drawn from: "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State." (2011, updated 2014). Annals of the New York Academy of Sciences, 1244: 2-649. https://doi.org/10.1111/j.1749-6632.2011.06331.x

12. Pg. 23 - Village of Lancaster Extreme Weather Vulnerability Assessment. 2020. Prepared by C&S Companies.

13. Pg. 23 - Erie County Climate Vulnerability Assessment Hazards Summary Report Draft. 2020. Prepared by Susan Clark et al.

14. Pg. 24 -Vermette, Stephen. "Weathering Change in WNY: Climatic Trend Analysis (1965-2016)," 2017. And, U.S. Global Change Research Program, CMRA Assessment Tool using National Climate Assessment LOCA data, 2018. Accessed July 2023 at resilience.climate.gov/ **15. Pg. 25 -** Vermette, Stephen. "Weathering Climate Change in WNY: Climatic Trend Analysis (1965-2016)," 2017. "Thunderstorm" wind events are those caused by storms with wind exceeding 58 miles per hour.

16. Pg. 25 - American Lung Association, "State of the Air," 2023. Accessed September 2023 at https://www.lung.org/ research/sota/key-findings

17. Pg. 26 - Boland, Brodie et al. "Focused Adaptation: A Strategic Approach to Climate Adaptation in Cities." McKinsey Sustainability and C40. 2021.

18. Pg. 26 - Erie County Climate Vulnerability Assessment Hazards Summary Report Draft. 2020. Prepared by Susan Clark et al.

19. Pg. 26 - Erie County Climate Vulnerability Assessment Hazards Summary Report Draft. 2020. Prepared by Susan Clark et al.

20. Pg. 28 - Existing, Expected, and Extreme climate scenarios were developed using projections from NOAA CMRA Assessment Tool using National Climate Assessment LOCA data, 2018. Additional analysis on winter precipitation projections from Notaro, Bennington, and Vavrus, "Dynamically Downscaled Projections of Lake-Effect Snow in the Great Lakes Basin," American Meteorological Society, Journal of Climate, 2014.

21. Pg. 36 - Strategy performance scores for potential approaches, (pages 37-43) are adapted from McKinsey Sustainability & C40 Cities, "Focused adaptation: A strategic approach to climate adaptation in cities," July, 2021.

22. Pg. 42 - Boland, Brodie et al. "Focused Adaptation: A Strategic Approach to Climate Adaptation in Cities." McKinsey Sustainability and C40. 2021.

IMAGE CREDITS

Pg. 18 - Cayuga Creek Park Construction - Gavin O'Brien

Pg. 20 - EV Charging Stations - UBRI

Pg. 20 - Tree Planing - Lynne Ruda

Pg. 20 - Green Infrastructure - Gavin O'Brien

Pg. 20 - Shade Tree - Gavin O'Brien

Pg. 25 - Wildfire Smoke - Colorado Department of Public Health & Environment - Air Pollution Control Division, May 19, 2023. https://twitter.com/cdpheapcd/ status/1659537882133204992.

Pg. 25 - Spotted Lantern Fly - Cornell University College of Agriculture & Sciences

Pg. 25 - Emerald Ash Borer - Google Images (Creative Commons)

Pg. 27 - Central Ave. Rain Garden - Gavin O'Brien

Pg. 29 - Youth Scenario Planning Workshop - UBRI

- Pg. 46 Youth Scenario Planning Workshop UBRI
- Pg. 46 Ribbon Cutting Lynne Ruda
- Pg. 47 Water tower Gavin O'Brien
- Pg. 47 Park/Splash Pad Gavin O'Brien
- Pg. 47 Snowstorm Lynne Ruda

Appendices

Appendix Materials for this plan are available online at: <u>https://buffalo.box.com/s/2tukuvy0e</u> <u>9chvolwooutco7hxf6eu48b</u>

Appendix Materials include:

Community Survey Materials

- Community Survey Questionnaire
- Community Survey Summary of Results

Community Resilience Workshop Materials

- Agenda
- Presentation
- Handout
- Feedback

Public Draft Plan Community Meeting Materials

- Presentation
- Feedback

Plans

• Links to Existing Planning Documents Referenced in this Plan

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