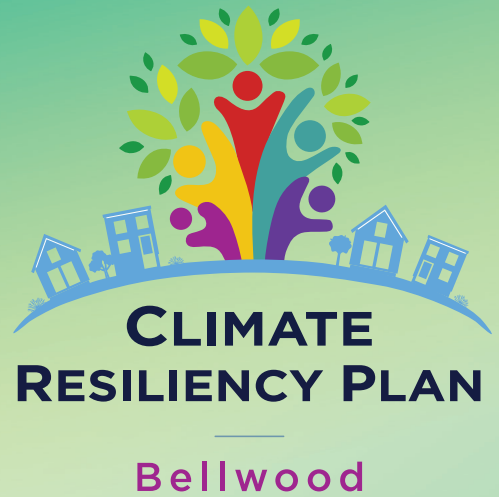
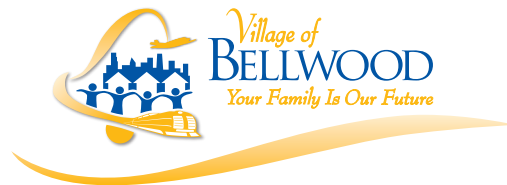


Bellwood

CLIMATE RESILIENCY PLAN



COOK COUNTY
DEPARTMENT OF
**Environment &
Sustainability**

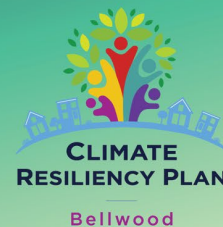


Geosyntec
consultants

METRO
STRATEGIES
group



Bellwood Climate Resiliency Plan



E.1. Executive summary

The Village of Bellwood (Village) partnered with the Cook County Department of Environment and Sustainability (DES) to develop a comprehensive Climate Resiliency Plan (CRP) intended to help the Village identify projects to prepare for climate-related impacts and serve as an educational tool.

The CRP was developed through an inclusive, community-driven approach. It involved active participation from residents, volunteer groups, institutions, businesses and Village and County staff. This collaborative effort assessed current impacts, established goals and prioritized actions to mitigate hazards and enhance the community's resilience.

Community Background

The Village of Bellwood, originally farmland, saw its first subdivisions established in the early 1890s before being incorporated on May 21, 1900. Today, Bellwood is a mature, primarily residential suburb with a rich history located in Cook County, approximately 14 miles west of downtown Chicago. It borders several neighboring suburbs, including Stone Park, Northlake, and Melrose Park to the north; Broadview and Westchester to the south; Maywood to the east; and Berkeley and Hillside to the west.

The Village is a largely built-out community with limited space for expansion, focusing primarily on redevelopment, including ongoing improvements to the Mannheim Road corridor and St. Charles Road area. The Environmental Protection Agency's environmental justice screening reports Bellwood ranks in the 90th percentile for particulate matter air pollution levels and flood risk. There is a severe shortage of publicly accessible green space and walkable areas, and most of the population lives in a qualified food desert (i.e., having limited access to affordable and nutritious food).

The priorities identified by community stakeholders include addressing frequent flooding and stormwater management issues; tackling the lack of funding and resources for maintaining existing infrastructure and implementing long-term solutions; mitigating the effects of urban heat islands; establishing landscaping and tree management policies and programs; expanding and diversifying revenue sources; enhancing staff training programs and public education initiatives; and promoting the use of green infrastructure (GI) throughout the Village.

Current and Projected Climate Hazards

Local governments are increasingly facing impacts from climate change, which are projected to worsen through the end of the 21st century and beyond. These impacts include larger, longer, more intense precipitation events, increasing atmospheric temperatures, extreme storm events, and poor air quality. Climate hazards can create cascading impacts across interconnected systems, adding stress to critical utility and service infrastructure that will require improved planning and sustainable design and management approaches that will better position the community to address issues as they arise.

Like many communities in the Midwest, the Village of Bellwood is vulnerable to climate hazards such as precipitation and flooding, extreme heat and wind. During community engagement efforts, Village staff and residents identified specific areas in the community that either currently experience climate hazards or are locations where climate resiliency measures could be implemented. The identified locations and their associated climate hazard are shown in Figure E-1.

Bellwood Climate Resiliency Plan



Figure E-1: Problem and Opportunity Areas Identified by the Community

Precipitation and Flooding

Extremes in precipitation (rain and snow) are the most likely local outcomes of a changing climate. In the last 15 years, seasonal trends have shown increased rainfall during the summer months. Since 2017, the frequency of stretches with consecutive rainy days has increased by about 3.5 days. Consecutive rainy days can cause the ground to become saturated from the first storm, leading to an increased risk of flooding as more rain falls with nowhere to infiltrate.

In Cook County, high-intensity storms are likely to become more common. Daily rainfall depths are not projected to change measurably for a 2-year storm (50% chance of occurring in any given year). However, depths are projected to increase by 6% for the 10- and 25-year storms (10% and 4% chance of occurring in any given year, respectively). Chart E-1 summarizes how rainfall is projected to change under two different climate change scenarios: moderate (SSP2-4.5) and severe (SSP5-8.5). These increases can be significant for stormwater systems that currently flood during smaller storms.

Bellwood Climate Resiliency Plan

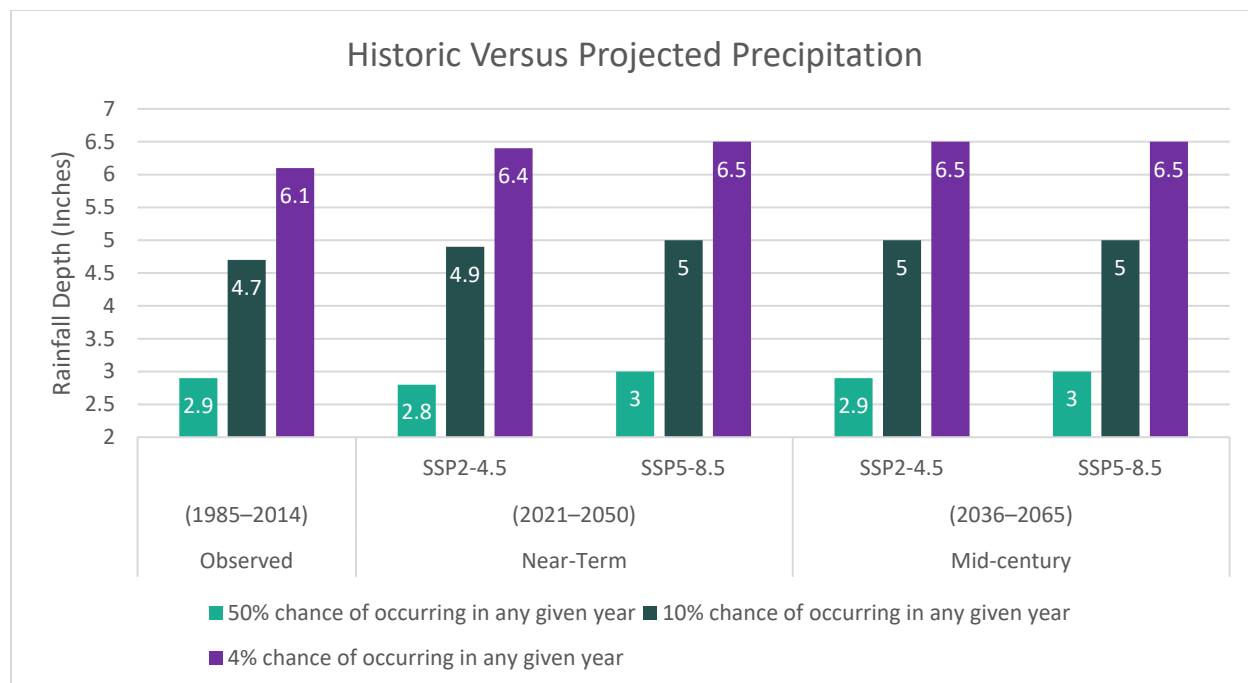


Chart E-1: Cook County Precipitation Projections for Return Periods under Moderate (SSP2-4.5) and Severe (SSP5-8.5) Climate Change Scenarios

Historically, Bellwood has experienced urban flooding, including roadway and infrastructure flooding. The Village is proactively working to address flooding concerns through various stormwater management best practices and GI implementation. Through the community engagement process, locations with flood concerns were identified, mostly coinciding with major overland stormwater flow paths. Planning and coordination will become especially critical as future changes result in increased rainfall. Locations that currently experience flooding issues could experience more severe issues, while problems could also emerge at additional locations. Figure E-2 shows which areas in the community are more likely to see an increase in ponding during a storm with a 10% chance of occurring in a future year (the 10-year storm event) if the stormwater infrastructure cannot accommodate increases in rainfall depths. By the year 2050, climate change could create 86 acre-feet of additional ponding throughout the community during the 10-year event. Projections suggest that, by mid-century, a 10-year storm event could increase the excess stormwater runoff to fill one football field with approximately 66 feet of water.

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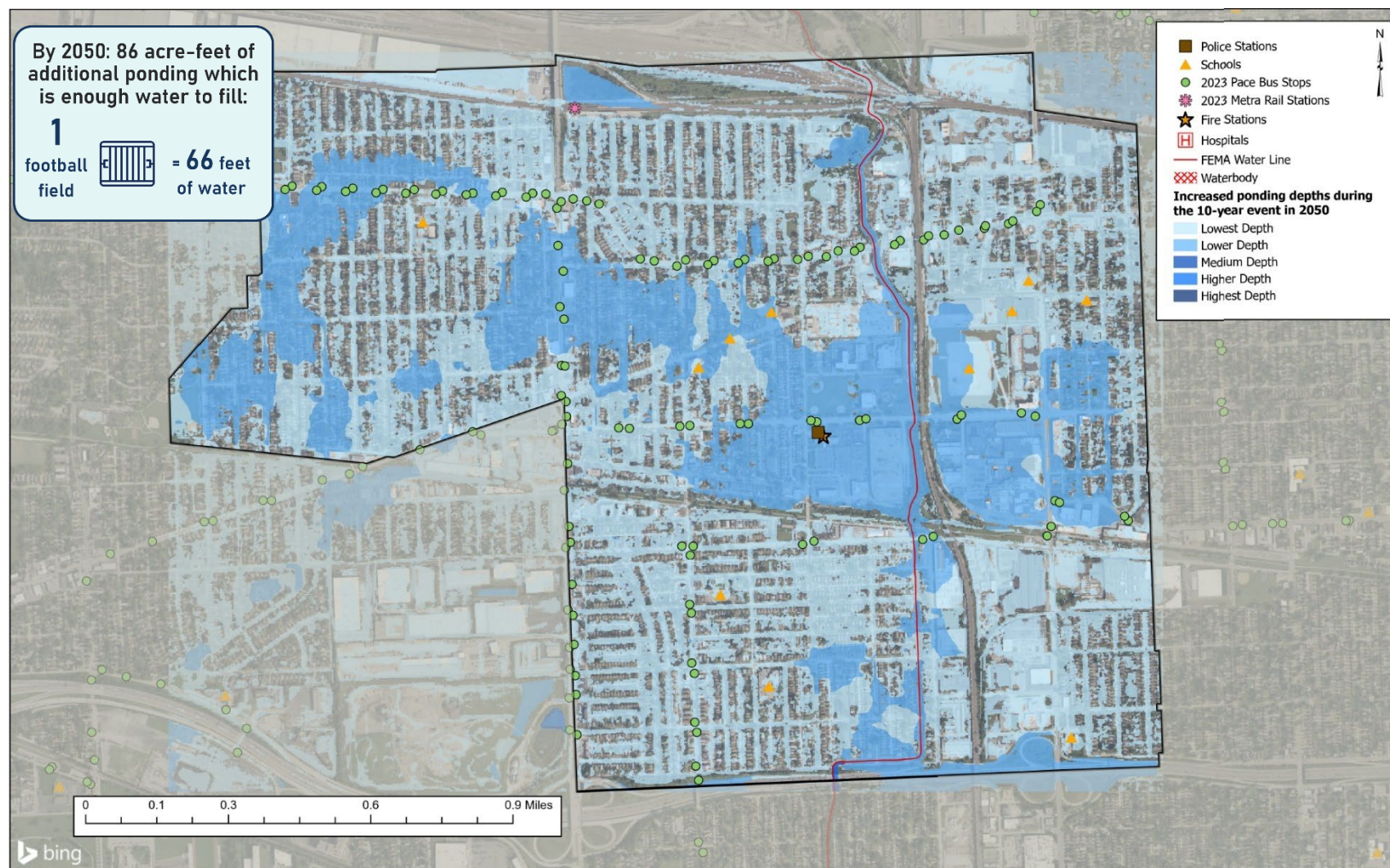


Figure E-2: 10-Year Ponding Depth Increase for the Year 2050

Bellwood Climate Resiliency Plan

Extreme Heat

Cook County has historically experienced significant impacts from extreme heat, which severely impacts human health, particularly among vulnerable populations. Extended exposure to temperatures nearing 90 degrees becomes acutely dangerous, particularly as humidity increases. Cook County might be near these dangerous temperature thresholds more frequently in the future and have more prolonged exposure to heat waves. Chart E-2 shows the projected increases in the hottest days and nights, which could be especially pronounced in the higher emissions scenario by mid-century. The frequency of heat waves, defined as three or more consecutive days with a maximum temperature of 90 degrees or above, is projected to increase from two per year to five or six per year by mid-century. Additionally, the longest duration of heat waves is projected to increase from four days to nine to 11 days by mid-century.

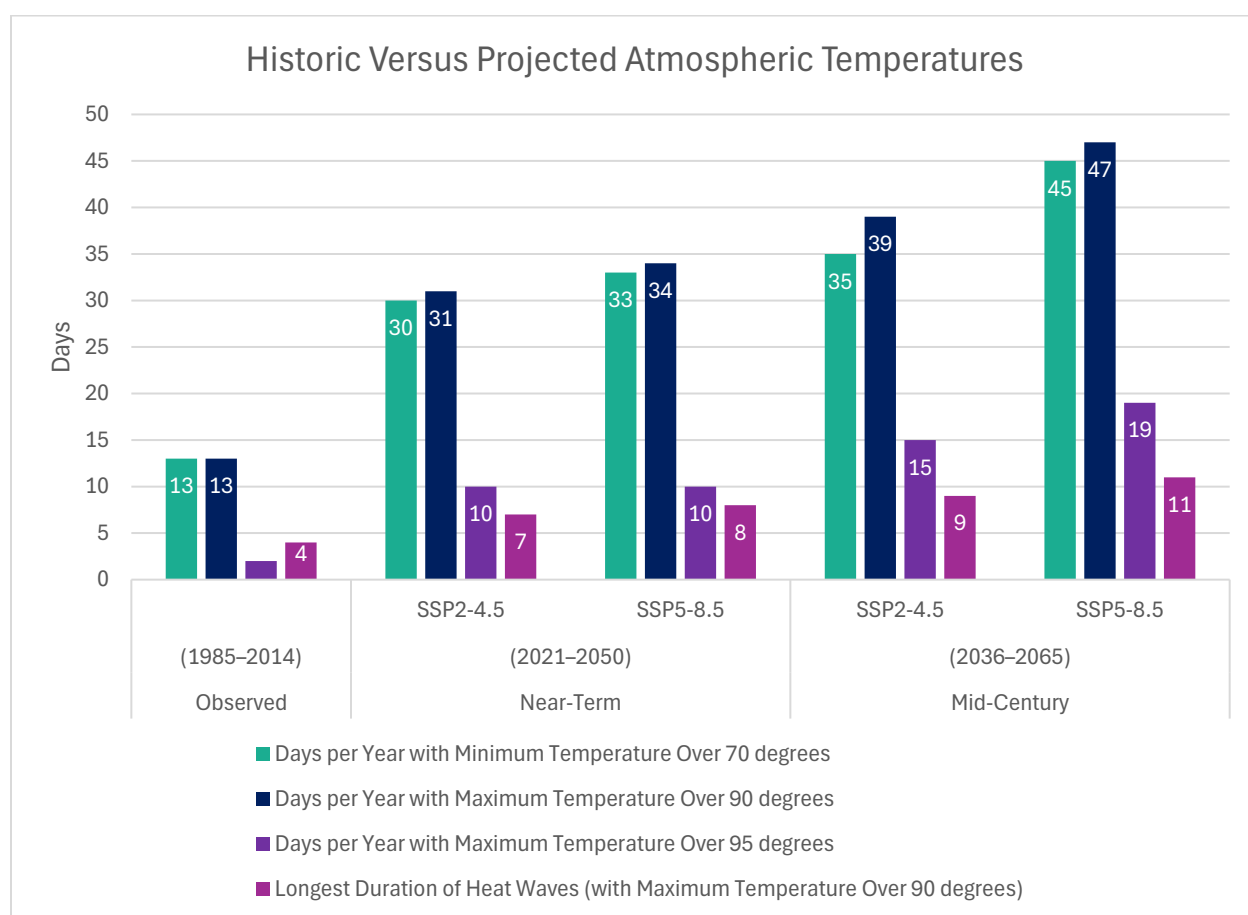


Chart E-2: Climate Projections for Cook County Temperature and Heat Wave Variables

Extreme Winds and Wind Gusts

In Cook County, extreme wind speeds and wind gusts have the potential to cause substantial physical damage, from downed trees and utility poles leading to power outages to structural damage to residential and commercial buildings. Average wind speeds are not projected to change much due to climate change, but the most intense gusts could become more frequent and stronger by the mid- to late-21st century. Additionally, preliminary studies suggest conditions may become more favorable for thunderstorms and other high-wind events, possibly extending the severe thunderstorm season.

Bellwood Climate Resiliency Plan

Community Concerns, Visioning and Resiliency Goals

Bellwood's CRP was developed through a community-driven engagement effort that included three rounds of engagement at key stages of the planning process, as depicted in Figure E-3. Each round of engagement built on previous efforts to help develop a community vision, goals and plan recommendations. The engagement process ensured that Village staff, residents, businesses and other stakeholders, including key resident groups, community organizations, and local leaders had the opportunity to:

- Voice their top priorities, concerns, and issues
- Generate ideas for outcomes, solutions, and projects
- Provide feedback for the draft vision and goals and recommendations
- Help prioritize recommendations

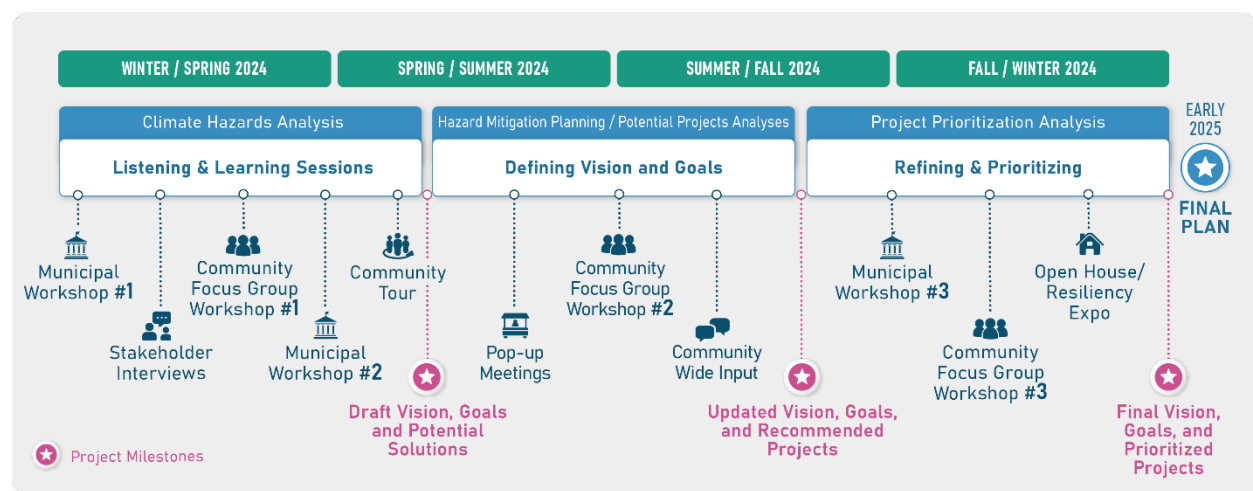


Figure E-3: Community Engagement Planning

Community priorities gathered through the engagement process highlighted top climate concerns and opportunities:

- Residents and Village staff have expressed their desire to see additional green spaces added to the community, including projects that show long-term value for future generations. Examples mentioned include additional tree canopy and replanting downed or diseased trees, taking advantage of unused lots and turning them into community gardens and gathering spaces and implementing distributed GI.
- Having support and resources in place to respond to weather events reduces impacts on residents and businesses that can diminish their quality of life.
- The Village has multiple locations that serve as heating and cooling facilities to ensure students, businesses, and residents can access safe living conditions during extreme heat and cold spells. Many buildings, specifically senior apartments, were identified as having poor heating and cooling insulation and may lack accessibility or transportation to heating and cooling facilities.
- Increase economic and commercial development by prioritizing upgrades to existing infrastructure and updated design standards, providing resources for energy-efficient upgrades, and increasing weatherization and insulation improvements for existing buildings.
- Educate Village staff and community members on the impact climate change can have and the efforts the Village is taking to mitigate these impacts. Additionally, targeted programs should be developed that push communication, education and engagement for a wide array of people.

The community engagement effort where specific inputs and feedback were gathered helped to formulate a vision statement and establish climate resilience goals for the Village:

Bellwood Climate Resiliency Plan

Vision Statement

"Convenient accessibility, rich history and lush, tree-lined streets make the Village of Bellwood one of the County's best kept secrets. In its ongoing commitment to quality of life for all residents, Bellwood is preparing for the impacts of climate change and extreme weather events. These efforts will contribute to a clean, green and safe future that supports a thriving local economy, flourishing ecosystems and family-friendly life across Bellwood's diverse community."

Village of Bellwood Community Resilience Goals

Upgrade infrastructure to ensure that the community is prepared for and can overcome the impacts of extreme weather.

Support local economic development by safeguarding new and existing businesses' ability to serve the community in the face of extreme weather events.

Establish resilient and affordable housing and building standards to attract and retain families and homeowners to Bellwood.

Increase tree canopy and green spaces to reduce the impact of flooding and heat on the community, and to create recreational spaces for youth and the community at large.

Improve walkability, support electric vehicle use and strengthen infrastructure to make transportation resilient, sustainable and accessible for all Bellwood residents.

Equip Bellwood's leadership with the tools and knowledge necessary to prepare for and support the community through hazardous climate events.

Collaborate with and educate stakeholders on the impacts of climate and weather hazards to engage Bellwood's diverse community with resilience efforts.

Projects, Prioritization and Implementation

The community engagement process identified specific locations with climate hazard concerns and opportunities for implementation, especially those that reduced impervious land cover. Clusters of these locations (a.k.a. focus areas) were assessed using publicly available information, and a list of recommended projects was developed for each focus area. Below is an overview of the focus areas, while Figure E-4 shows the locations of the focus areas in Bellwood.

Focus Area 1: Sewer System Pump Stations

The Village is equipped with several pump stations that are essential for transporting both stormwater and sanitary sewage downstream. These pump stations lack backup generators, which are critical to ensuring uninterrupted operation. Stakeholders have expressed concerns regarding the absence of backup power for these stations, particularly during power outages. Given the vital role these pump stations play in managing wastewater and stormwater, it is imperative to maintain a consistent level of service. It is recommended that backup generators be installed at all pump station locations throughout the Village of Bellwood. This strategic improvement would enhance the community's capacity to manage flooding and prepare for climate-related hazards. Backup generators would ensure that pump stations remain operational even during power outages, thus protecting public health and preserving the integrity of local infrastructure.

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Focus Area 2: 23rd and Grant Avenues Green Infrastructure

At the intersection of 23rd Avenue and Grant Avenue, the Village has experienced significant flooding issues. This area is characterized by its low-lying topography and is subject to overland runoff from an adjacent industrial site. The presence of extensive impervious surfaces including buildings, parking lots, alleys and street pavement, exacerbates the accumulation of stormwater runoff in the area. Recommended solutions for addressing flooding and stormwater runoff in this area include the implementation of GI within the public right-of-way on both the east and west sides of the road, immediately adjacent to the flood-prone zones. These GI measures aim to reduce runoff, provide stormwater storage and enhance flood resilience. Another proposed solution is the development of green alleys, which would replace traditional impervious pavement with permeable pavers in select alleyways. This design would capture and directly infiltrate stormwater into the ground, reducing runoff at the source and enhancing the overall stormwater management capacity of the area.

Focus Area 3: Residential Area West of Mannheim Road

This area includes specific locations of concern for flooding near Mannheim Road north of Butterfield Road and south of St. Charles Road. Mannheim Road falls under the Illinois Department of Transportation's (IDOT) authority. Along the Mannheim Road corridor the area is characterized by a mix of highly commercial, impervious surfaces, such as buildings and parking lots. This commercial development is juxtaposed with a primarily residential neighborhood to the west of Mannheim Road, which includes green space along the public right-of-way. The area experiences frequent localized flooding, primarily due to inadequate sewer capacity, significant impervious tributary area and limited stormwater detention systems. These issues are particularly pronounced in smaller downtown storefronts and businesses along Mannheim Road, which are more vulnerable to weather-related disruptions. Additionally, areas along Geneva Avenue, Hyde Park Avenue, Butterfield Road and Oak Street west of Mannheim Road are prone to localized flooding. The Village believes that this flooding is largely a result of the storm sewer system's insufficient capacity to manage runoff during intense rainfall. Effective stormwater management solutions are crucial for addressing flooding risks in these areas and ensuring the safety and resilience of both commercial and residential properties.

Focus Area 4: Sewer System West of Mannheim Road

The Village previously separated its combined sewer system; however, many areas still contain legacy connections and deteriorating infrastructure, including open joints and outdated connections, allowing stormwater to infiltrate the sanitary sewer system. This infiltration exacerbates the potential for system overload during periods of heavy rainfall, leading to surcharging, sewer backups and localized flooding. During heavy rains, stormwater migrates into the sanitary sewer system through old connections or open joints, particularly in the area west of Mannheim Road at locations in the Hyde Park Lift Station and Park Street sanitary sewer system. When these problems remain unaddressed, they can significantly impact residents causing flooding in homes and streets, damaging property and ultimately leading to costly repairs and disruptions in service.

Focus Area 5: Upstream of Addison Creek

Focus Area 5 centers on the recurring flooding issues along Addison Creek, which impact residents near the creek and upland areas. Addison Creek runs north-south through the center of the Village of Bellwood and falls within the Addison Creek sub watershed, an area that has long experienced regional flooding concerns. As the main stormwater drainage point for the surrounding area, the creek is essential for managing runoff during rain events. However, when the creek exceeds its capacity and overflows, the system becomes overwhelmed, leading to widespread flooding. This overflow disrupts local communities, causing property damage, infrastructure strain and potential health and safety risks. In 2023, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) completed construction of a 600-acre-foot reservoir at 2795 Washington Boulevard that benefits six communities and reduces flooding for approximately 2,200 properties along Addison Creek. In addition to the reservoir, MWRD also started construction of Addison Creek channel improvements and anticipate completion in 2026. As part of these

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improvements, two creek reaches within Bellwood will be improved, and a third stretch of creek will have bridges removed. Bellwood residents have already experienced some flood reduction benefits attributed to the improvements. Due to the nature of the flooding, the Village should continue implementing additional flood mitigation strategies to improve the area's resilience and reduce the potential impacts on residents and businesses.

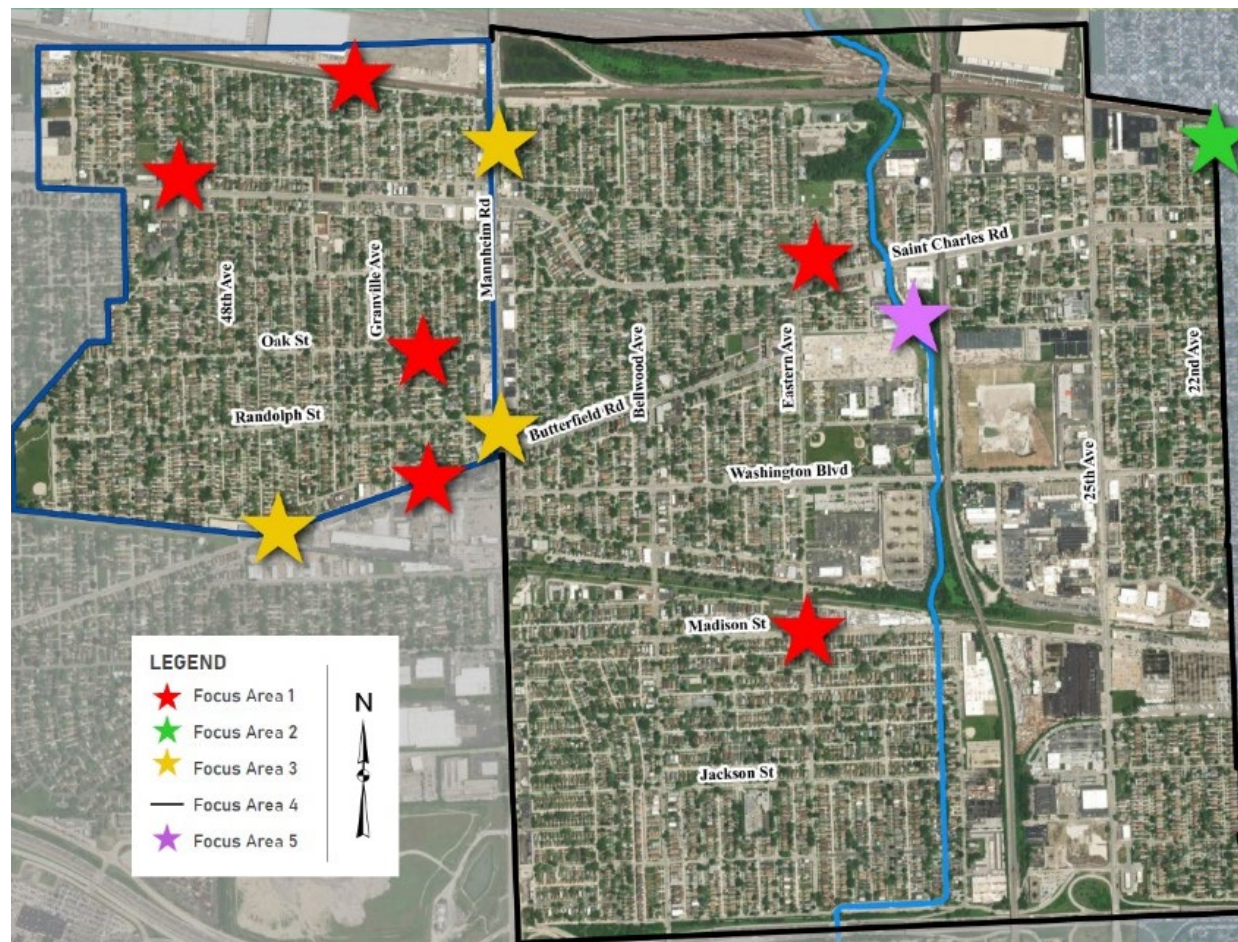


Figure E-4: Overview of Bellwood's Five Focus Areas

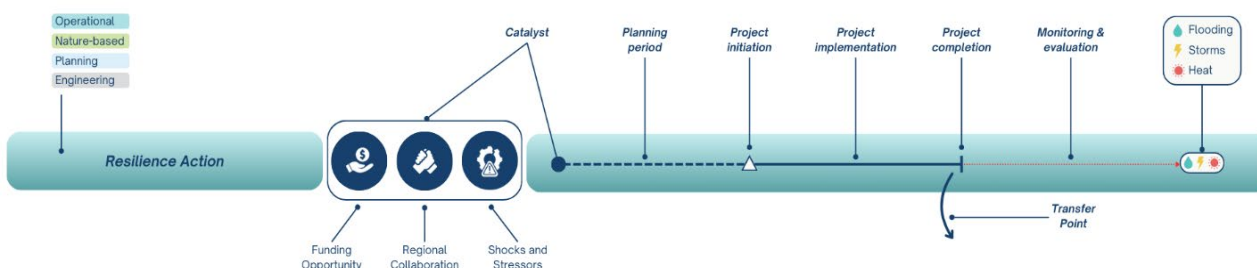
The focus area analysis identified six short-term projects and solutions that were added to the list of projects previously identified through community planning efforts. This project list is intended to help Bellwood become more resilient to the impacts of climate change by better preparing for anticipated climate hazards. The Village intends to add more projects as problems are addressed or new concerns arise.

Adaptation Strategies and Pathway

To help Bellwood achieve long-term climate resiliency, the CRP outlines a flexible implementation plan called an adaptation pathway. This strategic framework outlines how the Village might efficiently sequence, prioritize and implement resilience actions over the coming decades and how it can adjust its approach in response to external factors such as funding opportunity, regional collaboration and climate stressors. Adaptation pathways address existing problems and lay out a flexible, cost-effective course toward a more resilient future. Implementation of community-wide resilience actions will follow the sequenced, interconnected adaptation pathway illustrated in Figure E-5.

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In conjunction with the adaptation pathways, the CRP outlines seven adaptation strategies with specific actions to meet community goals and address climate hazards.



Color codes indicate “type” of resilience action

Operational	Actions may include a system or program to achieve a certain resilience goal.
Nature-based	Actions refer to green infrastructure aimed at mitigating a specific hazard.
Planning	Actions include ordinance or policy changes that encourage a resilient practice.
Engineering	Actions refer to new or updated gray infrastructure targeting a specific hazard.

Transfer points are triggered by catalysts or changes in climate hazards experienced by the community at the time.

Catalysts identify key external factors that may initiate Bellwood’s pursuit of a given resilience measure. The three key catalysts are funding opportunities, regional collaboration and shocks and stressors – e.g., hazards worsening either through repeated impacts (i.e., stressors) or extreme events (i.e., shocks).

Figure E-5: Illustration of an Adaptation Pathway

In conjunction with the adaptation pathways, the CRP outlines seven adaptation strategies with specific actions to meet community goals and address climate hazards.

1. **Flooding and Stormwater Management:** Lack of stormwater master planning, coupled with uncertainty on the original basis of design and condition of infrastructure assets, often results in a reactive maintenance approach, emergency situations due to asset failures, poor water quality and implementation of costly and oversized infrastructure. To build a resilient community that can withstand future changes in rainfall patterns and implement cost-effective stormwater infrastructure, it is imperative to thoroughly understand Bellwood's existing storm sewer system network, system condition and capacity and plan for new infrastructure holistically. This helps verify the root cause of flooding and targets the community's investments toward cost-effective solutions.
2. **Implement Distributed Green Infrastructure Solutions:** Stormwater systems generally consist of two key components: conveyance and storage. Conveyance is essential for directing water downstream, while storage is necessary to manage the excess rainwater generated by impervious surfaces. The concept of stormwater storage became more prevalent after urban development led to increased flooding. However, available space often limits storage solutions, which requires additional strategies to manage stormwater volume. GI can help address this gap. Initially implemented to improve stormwater quality and enhance infiltration, GI can also mitigate small volumes of stormwater. Community feedback indicates that there is a desire and acceptance for GI as Bellwood has already had success in starting to implement distributed GI throughout the community. Strategic placement of GI can include storage solutions, although space constraints often limit its application. While the placement of GI should be carefully planned, it should also be adopted as a community-wide practice to maximize its effectiveness and impact.
3. **Increase Green Space and Heat Island Reduction:** Bellwood offers valuable green space and community opportunities, particularly through the Addison Creek corridor and the Prairie Path. In an urban environment, preserving and enhancing natural resources is essential for building resilience to climate impacts. These efforts help mitigate the expansion of impervious surfaces and provide residents with

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outdoor recreational spaces that promote mental well-being. Ecological restoration in an urban or suburban context involves preserving and improving local ecological features, such as integrating native plants and tree species, introducing these species to new habitats, and increasing species diversity within the community. Incorporating species diversity into project design strengthens resilience and adaptability, enhancing the overall resiliency of the area.

4. **Promote Sustainable Economic Growth:** To build a resilient community, the Village must prioritize both livability and economic stability, regardless of climate-driven challenges. Existing and potential businesses should feel secure from climate-related risks like flooding, temperature extremes and maintenance costs. Implementing strategies can help mitigate these risks while appealing to a growing number of businesses and consumers focused on resilience. Revitalizing business corridors to be more pedestrian-friendly by increasing green spaces benefits economic growth. Bellwood has several high-traffic corridors that connect to interstates and neighboring communities, making them ideal candidates for this transformation. Development challenges and climate hazards can limit sustainable growth and future development. New projects can create adverse climate impacts without clear development guidelines that discourage future residents and businesses from settling in Bellwood.
5. **Education and Outreach Programs to Residents and Businesses:** Educating the community is key to empowering Bellwood's residents and businesses to better prepare for climate hazards. Each climate hazard presents unique challenges that require tailored responses. Feedback from community engagement sessions highlights the need for ongoing education and outreach. This includes providing clear, accessible information to help residents understand the importance of climate resilience and the community's long-term vision. Strategy 5 focuses on engaging and educating the community about potential climate hazards, how to mitigate their impacts, and building confidence in residents' ability to respond effectively.
6. **Coordinate and Improve Climate Resiliency through Agency Interaction and Partnerships:** Bellwood's infrastructure is shared by multiple entities, including the State, County, neighboring communities and not-for-profit organizations. However, these agencies often work independently and in isolation when managing day-to-day operations, leading to inefficiencies and missed opportunities for collaboration. This lack of coordination and information sharing can create significant challenges for the Village of Bellwood, especially when addressing infrastructure needs, climate resilience and community development. Collaboration with entities such as Cook County, Illinois Department of Transportation (IDOT) and Tollway, local utilities, Illinois Prairie Path, neighboring municipalities and others is crucial to fostering stronger partnerships.

One goal of this plan is to identify and prioritize projects and solutions that will help Bellwood mitigate the impacts of climate change. A project prioritization framework was developed to help the Village score and rank projects and to help pursue additional funding to implement the higher-ranked projects. The framework establishes a repeatable, transparent, stepwise process enabling the community to prioritize future projects while focusing on holistic, cost-effective solutions that consider return on investment and community benefits.

For short-term implementation projects, the following should be prioritized highest:

- Shovel-ready projects the community is already considering implementing to mitigate climate impacts
- Projects that could be designed and permitted quickly
- Stand-alone projects that do not require multiple phases
- Capacity-building projects that improve hazard responses
- Projects that can leverage multiple funding sources

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The framework includes 10 project prioritization measures across four weighting criteria, shown in Table E-1.

Table E-1: Project Prioritization Framework

Community Weighting Criteria	Prioritization Measure	Description
Implementation Feasibility and Support	Jurisdictional Approval Barriers	The number of agencies that must approve a project for it to undergo construction, or to enact a policy. The total number of months likely needed for project/permit and policy review from all agencies.
	Community Support	Has the community been engaged regarding the project and is there support for implementation?
Cost	Implementation Costs	The amount of money needed (including staff hours) to implement a project/policy, minus grants, for each effective unit.
	Maintenance Costs	The amount of money needed annually to maintain a project/policy, minus grants, for each effective unit.
Greatest Resilience Impact	Project Flexibility	If the conditions causing a problem worsen, can the solution be modified or updated without replacement?
	Additional Climate Impact Benefits	Does the project attempt to address additional climate impacts?
	Continuity of Critical Services	Does a project help maintain critical services, such as ambulance services, sewage, electricity, and telecommunications during or outside of a temporary adverse climate condition?
	Level of Project/Policy Impact	Is this an important piece of a larger resiliency strategy (large impact) or is it stand-alone (smaller impact)? Direct and significant benefit vs. secondary benefit that is broader? For structural projects, how many people in the community will benefit from implementation? For policy/planning, does this allow for more impactful resiliency efforts to be undertaken in the future?
Ancillary Benefits	Replicability	How applicable is the project type to other areas under owner's influence/responsibility?
	Non-climate Co-benefit	Does the project provide additional benefits to the community that are not climate related? These benefits can be social, aesthetic, economic or biodiversity-related.

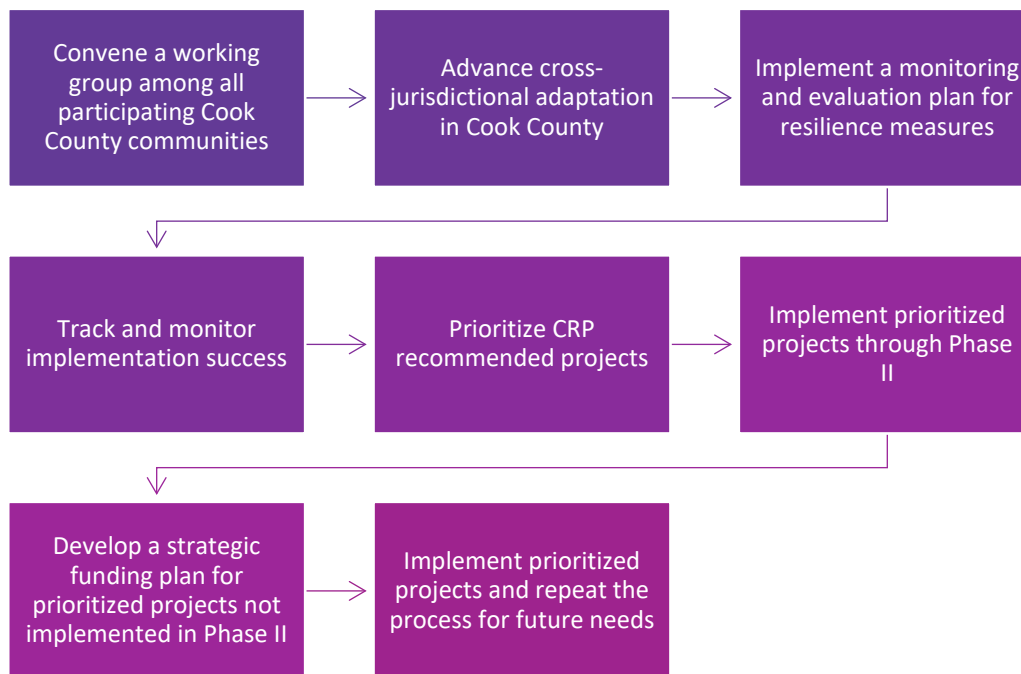
Roadmap for Resilience

As the planning process continues, the Village is already beginning implementation of priorities the community identified through the CRP. The second phase of the CRP will involve implementing identified projects based on community needs, funding availability and recommended project timelines. This phase will continue through 2026.

The consultant team that developed the CRP for the Village continues to support the planning effort through the Climate Smart Communities Initiative.

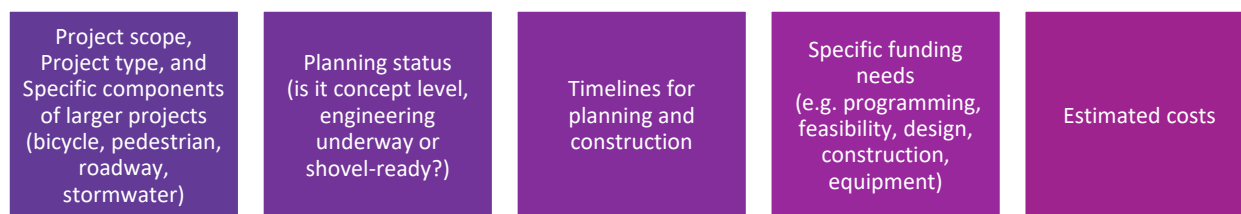
Bellwood Climate Resiliency Plan

This effort will continue through fall 2025 and will consist of:



To supplement the projects implemented through this program, starting early and developing a strategic funding plan will aid creation of competitive funding applications and increase the chances of awards. The first step is identifying and creating a list of priority projects—a step the Village has advanced through the CRP process— and customizing the funding strategy to this list.

The Village should review the CRP, any existing Village plans and any new plans as they are developed to help create the priority projects list. A well-developed priority projects list includes a high-level summary of the following key elements:



For larger infrastructure projects, some of the above aspects, such as schedule and cost estimates, may require advanced work including feasibility studies or preliminary engineering. This work can be completed with in-house municipal staff or consulting engineers. Technical assistance programs may help communities complete some of this advanced work if preliminary engineering funding is unavailable.