**Municipal Vulnerability Preparedness Program Action Grant Case Study**

**Municipality:** City of Northampton

**Project Title:** Climate Resilient Downtown Affordable Housing

**Award Year (FY):** FY23-24

**Grant Award:** $921,300

**Match: $**1,264,000

**Match Source:** Cash and In-Kind (labor and donation of land)

**One or Two Year Project:** Two-Year

**Municipal Department Leading Project:** Office of Planning & Sustainability

**Project Website URL:** [Office of Planning & Sustainability](https://www.northamptonma.gov/2069/Climate) and [Valley CDC](https://www.valleycdc.org/affordable-housing/in-the-pipeline/)

**Community Overview:**

* What is the population size of your community and where is it located?

The population of Northampton is 29,327 and it is located in the Connecticut River valley in Hampshire County of western Massachusetts.

* Do you have any [Environmental Justice](https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212) or other Climate Vulnerable communities? (Think about both those who live and work in your town.)

Northampton has both Minority and Minority & Income Environmental Justice Community block groups. They are concentrated in the downtown area, around the Smith College campus, and on the northern end of King St. where there are several affordable-housing units and housing for older adults. The City considers EJ communities, low-income individuals, people on a fixed-income, and people who are unhoused as especially vulnerable to climate change. This includes both acute dangers, such as heat waves, floods, and power-outages, but also chronic stresses such as increasing temperatures. Many people who work in Northampton cannot afford to live here and so live farther away. Relying on transportation also puts people at risk, whereby any weather related event could prevent them from getting to work, thereby putting their housing at risk.

* Other unique traits of your municipality like who the top employers are, geography, history, etc.

The top employers in the City are Smith College, Cooley Dickinson Hospital, and the industry with the second number of employees is the service industry. The geography and the history of Northampton are tied together.

Northampton, Massachusetts, originally known as "Norwottuck" or "Nonotuck" by the Pocumtuc inhabitants, was settled by English colonists in the mid-17th century. Sold to settlers from Springfield in 1653, the area faced significant turmoil due to hostilities between the Mohawk nation and the Pocumtuc confederacy, and a devastating smallpox epidemic in the 1630s. Officially established in 1654, the settlement's early years were marked by conflicts between Native American tribes and European settlers, which contributed to the outbreak of King Philip's War.

Northampton's boundaries expanded through the Equivalent Lands compromise but later saw portions carved out to form separate municipalities like Southampton, Westhampton, and Easthampton. In the 18th century, the city became a focal point during the Great Awakening under preacher Jonathan Edwards and hosted its own witch trials. After the American Revolution, Northampton gained prominence during events such as Shays' Rebellion in 1786 and the controversial executions of Dominic Daley and James Halligan in 1806. The 19th century brought industrial developments, including the ill-fated New Haven and Northampton Canal and the devastating Mill River flood of 1874.

The city earned the nickname "The Paradise of America" in the mid-19th century, partly due to its cultural and educational advancements, including the establishment of the Clarke Schools for Hearing and Speech in 1867 and Smith College in 1871. The early 20th century saw Northampton become a haven for immigrant communities. Despite economic decline in the mid-20th century, Northampton experienced a cultural renaissance, becoming a vibrant arts and music hub and a popular destination for the LGBTQ community. The city's rich history, marked by its resilience and cultural dynamism, continues to shape its identity today.

Northampton is celebrated for its historical significance, cultural vitality, and ongoing commitment to community and social justice. The city is a hub for education and alternative culture, with institutions like Smith College and the Northampton Association of Education and Industry contributing to its progressive reputation. Annual events such as the LGBTQ Parade and Pride event, along with its vibrant arts scene and eclectic dining, reinforce Northampton's status as a culturally dynamic and inclusive community.

**Project Description and Goals:**

* Where was the project located?

The City’s project is located behind City Hall on Main St. in downtown Northampton, and fronts the side street of Crafts Ave. The parcel was carved off of the end of the City Hall parking lot, providing an opportunity to fill in a void along the Crafts Ave. streetscape while also eliminating a failing retaining wall that contained a dilapidated and dangerous pedestrian staircase. The parcel is 425 ft. from the bus stop that is the pulse point for the City and 1,600 ft. from the Amtrak train station, connecting to Springfield, Connecticut and New York City to the south and Vermont and Montreal to the north.

* What climate change impacts did the project address?

This project will reduce severe and chronic impacts of climate change on the most vulnerable residents in our community. This is accomplished by creating desperately needed housing that is designed to use renewable resources and integrating passive-house building components and ground-source (geo-thermal) heating/cooling. This dramatically reduces the reliance on traditional forms of heating/cooling and electricity, making the impacts of extreme weather, power outages, and the cost of energy far less harmful. It provides 30 units of this sustainable housing for people who make less than 60% of the Area Median Income (AMI), with 20 set asides for people who are making less than 30% AMI, all with a preference for those who are unhoused. In targeting highly sustainable housing for people who are unhoused, we are providing support to those very vulnerable to weather related events and providing housing with wrap-around services that will alleviate much of the stress that they currently feel. Additionally, the project is designed with accessibility in mind. There will be five fully accessible apartments provided with the remainder of the apartments visitable. Of the 30 apartments, at least two will be set aside for referrals of the Department of Mental Health (DMH).

* What were the specific goals and tasks of the project as stated in your application?

The goal of this project was that it was to be designed around creating a nature based solution through a climate resilient building for low-income individuals and those experiencing homelessness. The design had specific requirements, such as:

1. Not relying on the flood-control levees for safety
2. Maximizing natural light and air
3. Using ground insulation for energy efficiency on the northerly and westerly sides
4. Utilizing rooftop solar photovoltaics for energy generation
5. No increase in impervious surface
6. Explore the feasibility of a 100% mass timber frame construction
7. Downtown location, close to services, transportation, and jobs

The project had other tasks that were part of the project, such as a kick-off meeting, community engagement, reporting (monthly, case-study, final presentation), donation of land for affordable housing, and the design through construction documents.

* Did your project meet the goals set forth in your application in terms of:
  + Employing nature-based solutions

Yes, the final design will be passive-house certified, includes permeable pavers surrounding a portion of the footprint, use of ground insulation, and include ground-source (geothermal) for heating and cooling and rooftop solar. Mass-timber was deemed to be too expensive and infeasible for this project. All of the other requirements for the design were able to be incorporated however.

* + Improving equitable outcomes for and fostering strong partnerships with EJ and other Climate Vulnerable Populations

Yes, the project team had an extensive an interview and engagement process with people with lived experience, from affordable housing, permanent supportive housing, and people experiencing homelessness. These groups are considered EJ community and the most vulnerable to climate change. Their input strongly influenced the design of the building and the inclusion of supportive services onsite. This created a sense of buy-in from these residents that they would not have if the building was built for them, without their input.

* + Providing regional benefits

Yes, homelessness and housing are a regional issue and the creation of housing benefits the entire region. People experiencing homelessness will often move between shelters or cities and use resources throughout the area. This permanent supportive housing project will provide housing for 30 people in our region.

Additionally, the survey, testing, design, certification, construction, and operations of this building will employ dozens of highly-skilled people throughout the region, multiplying the original funding amount circulating in the economy.

This project will serve as a model for others, such as municipalities, affordable housing developers, shelter and/or service providers, and funders. While this case study is written as part of the final reporting for the MVP grant, other funders such as Community Development Block Grant (CDBG) are also interested to learn from this project.

This can serve as a regional model not just for the sustainable systems incorporated into the building design, but also as a model for finding housing opportunity sites that are centrally located with access to transportation and other services. Our site is in a location that easily could have been overlooked, given what certainly presents as “leftover” and complicated piece of land. However, a small downtown parcel provides the opportunity for vertical development with great benefit as small footprint creating 30 residential units. There certainly are many such opportunities hiding in plain site that may remain undeveloped due to inertia, but for this project providing a model. Building in locations like this is critical to ensuring that we stem the practice of extending our community footprint further from services, which only necessitates greater reliance on single occupant vehicle travel, thereby increasing our carbon footprint.

* + Implementing the public involvement and community engagement plan set forth in your application

Yes, the developer for this project, Valley CDC, had a comprehensive public engagement process, focused on permanent supportive housing residents and people experiencing homelessness. The stakeholder interviews focused on their experience navigating housing, accessing resources, and design elements, such as the social dynamics of living within a building. The interviewees were from current developments for low-income residents, single-room occupancy studios, and an emergency shelter operated by the developer. Many of the interviewees have a physical and/or mental disability and all but one are single occupancy residents. They also interviewed agency staff, maintenance personnel, and shelter staff. The public engagement included the participation of neighborhood businesses and residents.

* + Finishing the project on time

This project would be on target to complete on time with a more traditional HVAC system. However, developing an option for geothermal system took more effort and therefore more time given the requirement for general ground thermal feasibility to be determined. The networked ground-source (geothermal) heating/cooling system added some complexity to this project, but the opportunity to include a system that did not rely on fossil fuels for heating and cooling was an opportunity that all of the parties involved wanted to undertake. Most of the deliverables will be complete by the end of the initial grant period (June 30, 2024). However, the final design through construction documents will only be 70% complete by June 30, 2024 leaving the geothermal system design component to be finalized. Thus, the 100% documents have been given an extension until September 30, 2024.

**Results and Deliverables:**

* Describe, and quantify (where possible) project results (e.g. square footage of habitat restored or created, increase in tree canopy coverage, etc.). Report out on the metrics outlined in your application.

The project did not increase the amount of impervious surface and remediated the site by removing a dilapidated City-owned public staircase and retaining wall. The will be passive-house certified, will have ground-source (geothermal) for heating/cooling, and not rely on fossil fuels for heating or cooking.

* Provide a brief summary of project deliverables with web links, if available.

Valley Community Development (developer) continues to update [their project on their website here](https://www.valleycdc.org/affordable-housing/in-the-pipeline/). The City has included this project into its [Climate Resilience & Regeneration page](https://www.northamptonma.gov/2069/Climate) as improving weatherization and energy efficiency of affordable housing was one of the top priorities of the [Municipal Vulnerability Program and Resilience Action Plan](http://www.northamptonma.gov/DocumentCenter/View/14859/Northampton_MVP-plan-update-WF3252020).

**Lessons Learned:**

* What lessons were learned as a result of the project? Focus on both the technical matter of the project and process-oriented lessons learned.

This project explored several options for its mechanical approach early on in design, weighing options for their performance, efficiency, durability, and cost. However, developing opportunities for funding available for geothermal systems and the decision of the City to allow this project to use land city-owned land for a geothermal system made geothermal viable for the project when it had initially been deemed cost prohibitive. So despite the team’s best effort to make sound decisions early on – changes in building technology and funding opportunities require flexibility and can be a challenge with fixed timelines. Shifting from a VRF mechanical system to a groundsource heat pump system will improve the projects energy performance and longevity – and it was deemed worthwhile despite the challenge of changing systems late in the design process.

The dimensional and topographic constraints of the site, cost increases, and seeking passive-house certification, further complicated the design decisions. The small site limited the overall footprint of the building – requiring the project pursue podium style construction in order to achieve the number of stories necessary to meet the program demand. Likewise, meeting the stringent energy performance requirements of Passive House (smaller windows, façade simplicity) compatible with Northampton’s historic downtown (bigger windows, façade complexity) was a challenge. The developer and architect had to strike a balance of creating an affordable-housing development that was buildable at a cost that could be funded with public dollars and energy efficient.

National Grid requirements for electrical connectivity and transformer location often produce constraints, which can impact the exterior design. This may be be incompatible with site the goals. This is a third party that needs to be engaged early and regularly in order to ensure pre-approval for electric connections.

The project also explored two construction pathways, one was a stick built on site construction method and the other was modular, wood framed off-site construction. The modular approach was potentially the more cost effective approach but the provider ultimately cancelled their relationship to the team when other business prospects emerged, and a replacement fabricator could not be located quickly. The small size of the project and the lack of modular construction firms to work with was a limitation to this potentially fruitful alternative.

* What is the best way for other communities to learn from your project/process?

If you are investigating ground source heating/cooling systems, especially if they are networked systems, give yourself extra time. There will inevitably be surprises buried below and the coordination between different parties will add time. It will also change your initial calculations and design of mechanical systems.

Space is limited within the building and on the roof for solar photovoltaic panels, solar hot water heaters, and other mechanical systems such as elevator, so you may not get everything that you want. Be realistic about space and cost.

Regarding engagement, if you are going to engage individuals with lived experience, it is important to communicate that their input is being gathered but may not be included in the final design. In this case, there were many helpful ideas gathered that were not possible to implement because of the constraints of Executive Office of Housing and Livable Communities funding guidelines for project scale and unit number. As an example, when the work began the agencies involved and the data available indicated a need for studio and one bedroom units to serve homeless individuals, but interviews encouraged a mixture of one- and two-bedroom units to support a healthier social mix of household types. In the follow up engagement towards the end of design, the number of families seeking permanent housing in Northampton had increased dramatically, re-emphasizing the need for more diverse unit sizes. Again, this small site’s constraints limited the project’s ability to provide the desired number of units without resorting to uniformity, but it is important to note that local housing needs in small communities do always not align with state assumptions and are likely to continue to evolve. Furthermore, it is a risk to relationships to engage and solicit opinions when those opinions may not hold sufficient power to influence the design process.

**Partners and Other Support:**

* Include a list of all project partners and describe their role in supporting/assisting in the project.
  + [Valley Community Development](https://www.valleycdc.org/affordable-housing/in-the-pipeline/) - affordable housing developer
  + [Office of Planning & Sustainability](https://www.northamptonma.gov/924/Planning-Sustainability) - MVP grantee, original land-owner
  + [Jones Whitsett Architects](https://www.joneswhitsett.com/) - architects and coordination
  + [Hesnor Engineering](https://hesnor.com/) - energy modeling and HVAC systems
  + [Stevens & Associates](https://www.stevens-assoc.com/) - civil engineering
  + [Precipitate](https://www.precipitatearch.com/) - passive building consultant
  + [PHIUS](https://www.phius.org/) - passive house certification
  + [GRTI](https://grti.com/) - geothermal testing and data analysis
  + [Allegrone Companies](https://www.allegrone.com/) – cost estimation and construction management

**Project Photos:**

* In your electronic submission of this report, please attach (as .jpg or .png) a few high-resolution (at least 300 pixels per inch) representative photos of the project. Photos should not show persons who can be easily identified, and avoid inclusion of any copyrighted, trademarked, or branded logos in the images. MVP may use these images on its website or other promotional purposes, so please also let us know if there is someone who should receive credit for taking the photo.