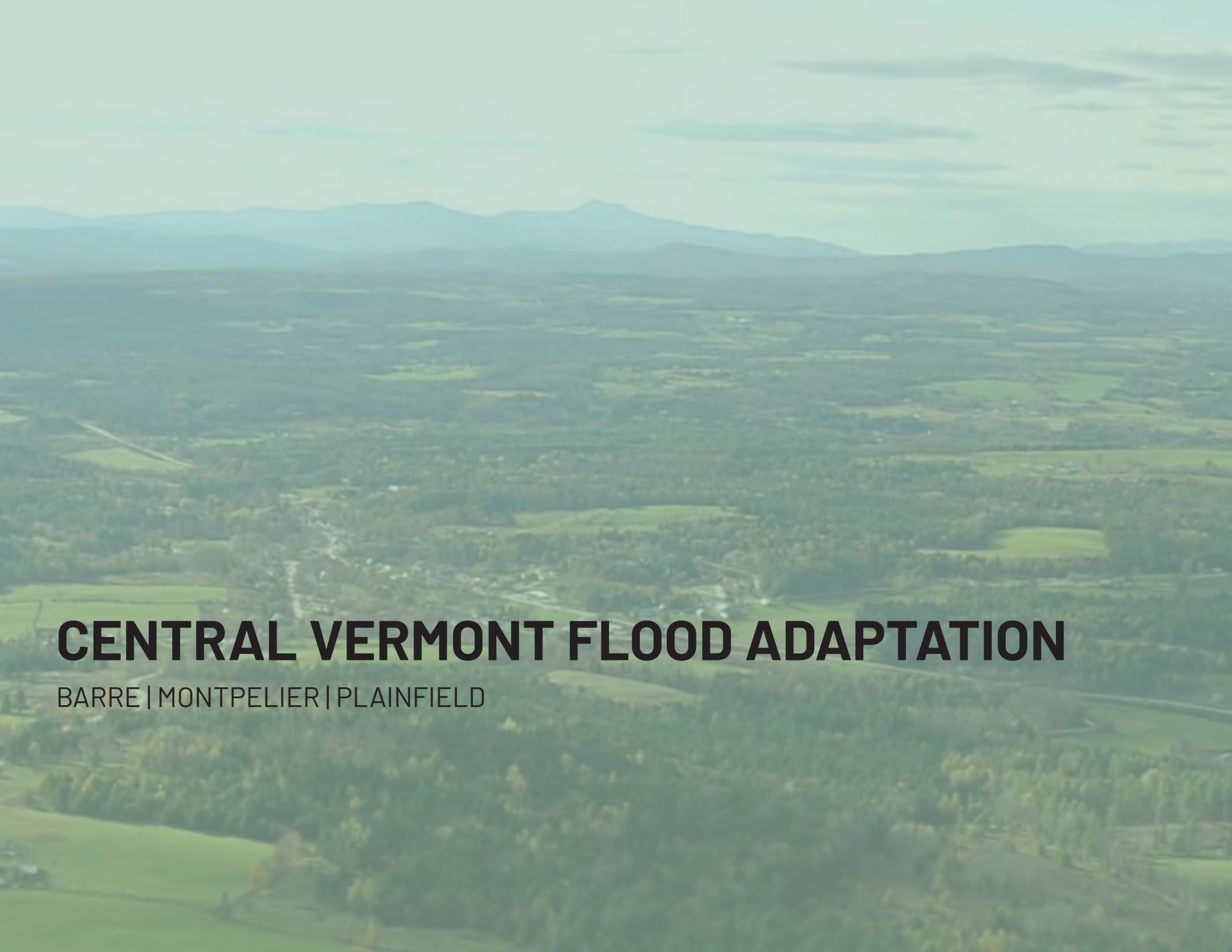

CENTRAL VERMONT FLOOD ADAPTATION

BARRE | MONTPELIER | PLAINFIELD

STUDIO TEAM

BARRE

Miranda Ayres, Urban Design
Varun Bhakhri, Transportation
Zach Somberg, Urban Design
Stewart Tillyer, Urban Design

MONTPELIER

Emily Zhou, Smart Cities
Jiayue Ma, Urban Design
Julia Nema, Land Use & Environmental Planning

PLAINFIELD

Christina Moss, Smart Cities
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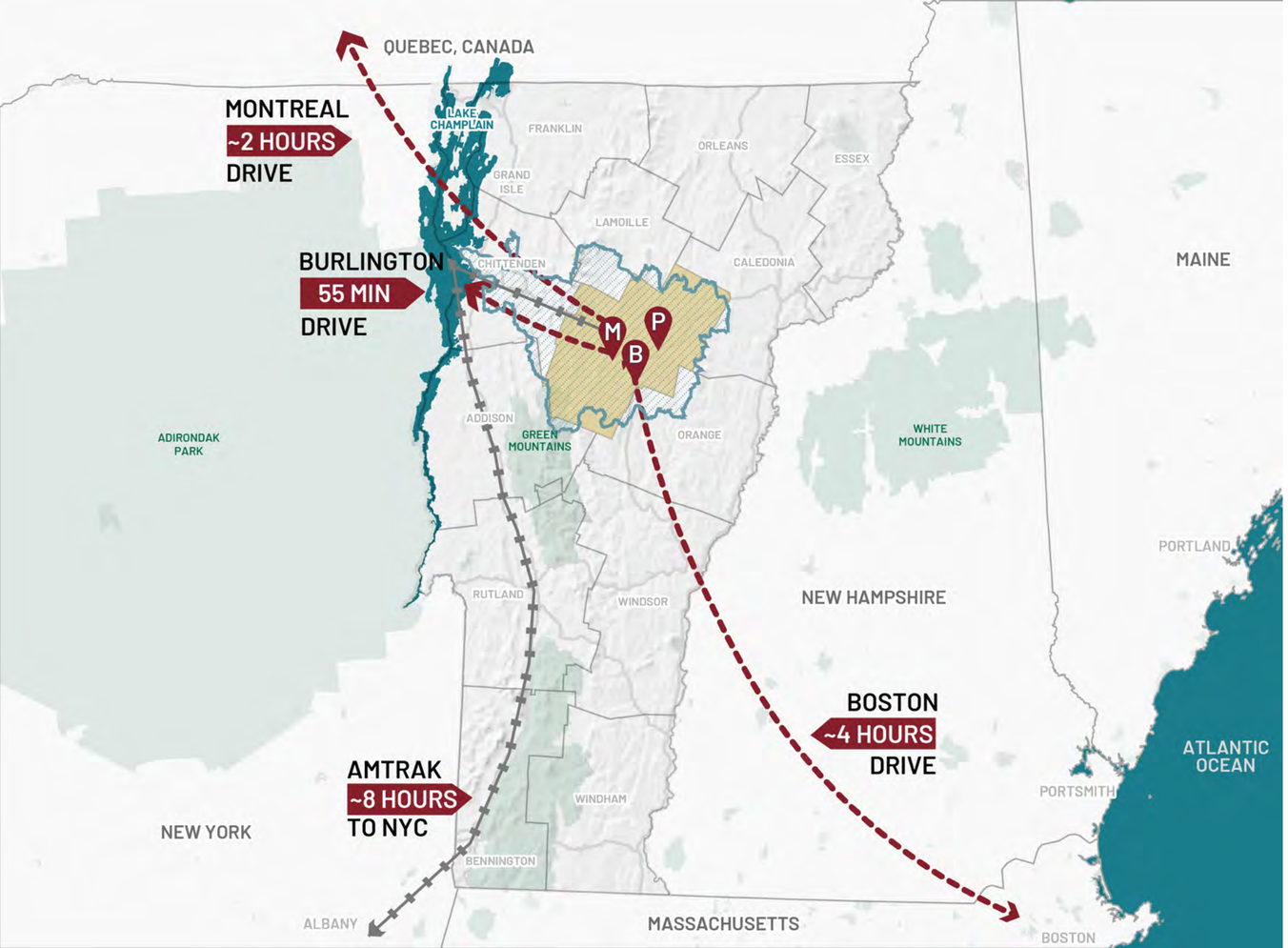
Mark Dellostritto, Housing, Community & Economic Development
Yujin Song, Land Use & Environmental Planning

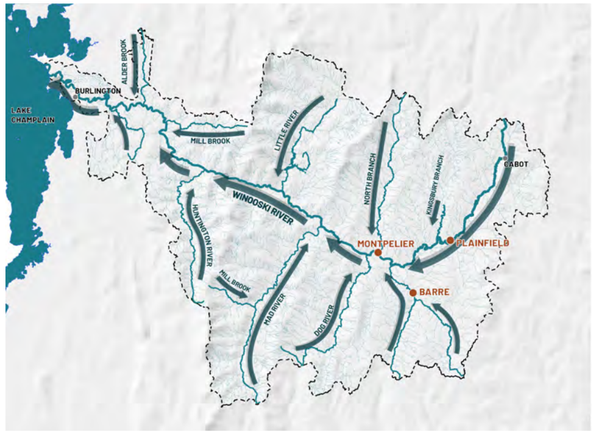
INSTRUCTORS

Scott Page, Principal, Interface Studio
Jamie Granger, Senior Associate, Interface Studio

TABLE OF CONTENTS



WINOOSKI WATERSHED

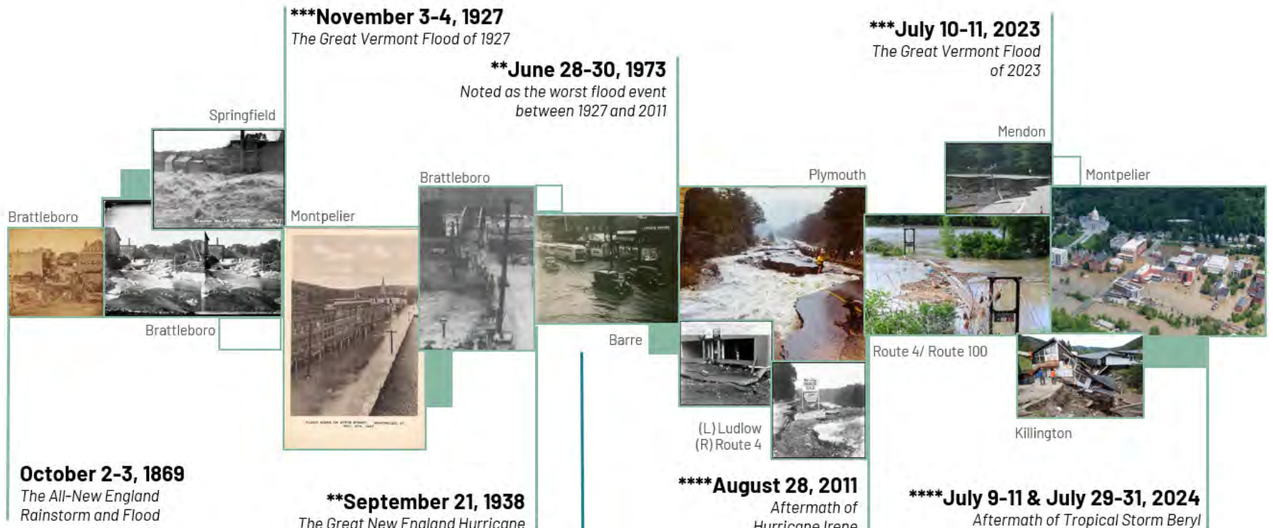


REGIONAL CONTEXT

- County Boundaries
- Railroad
- Washington County
- Winooski Watershed

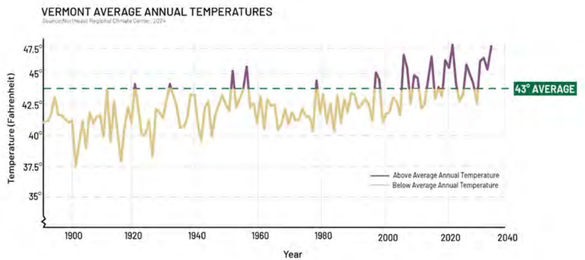
0 10 20 40 Miles

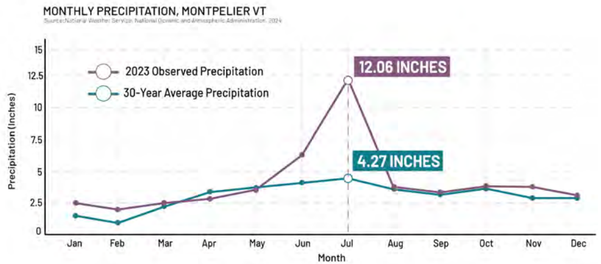
FLOODING IS NOT NEW TO VERMONT

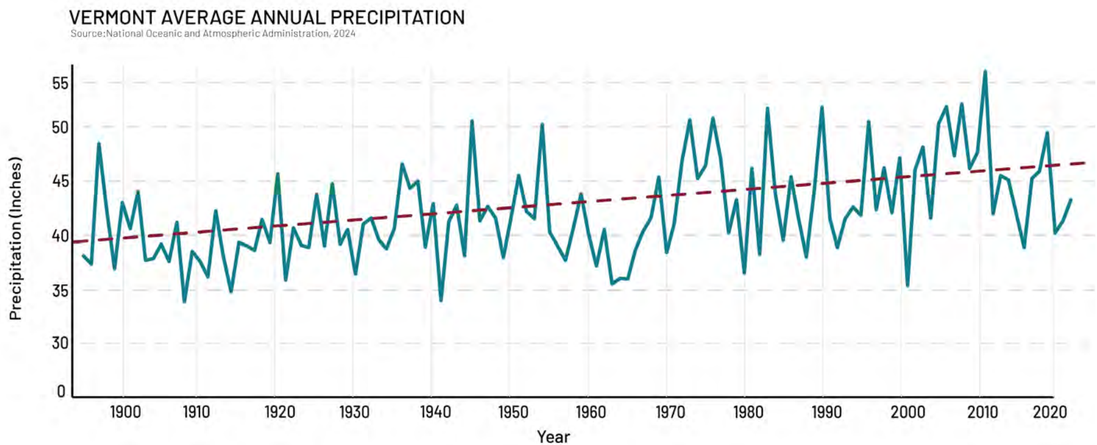


*Recurrence Interval: 1 in 10 years
**Recurrence Interval: 1 in 50+ years
***Recurrence Interval: 1 in 100 years
****Recurrence Interval: 1 in 1000 years

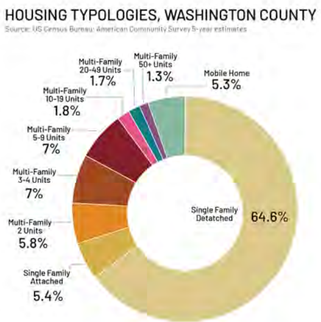
...AND BECOMING MORE FREQUENT

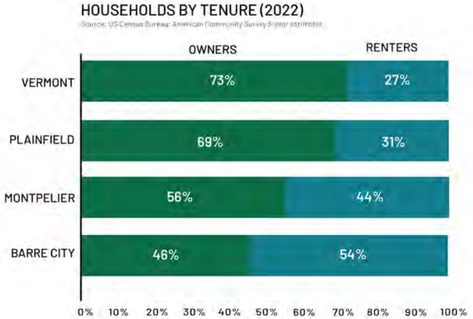


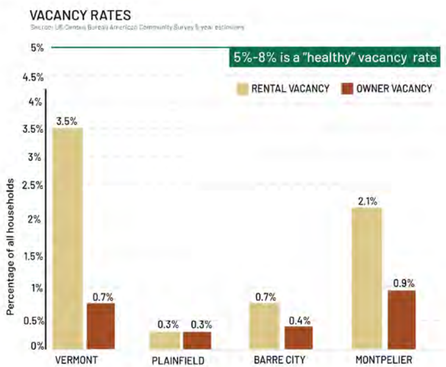


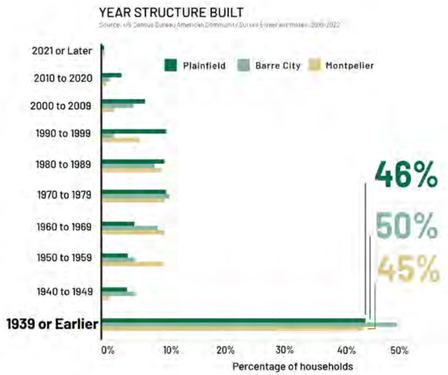


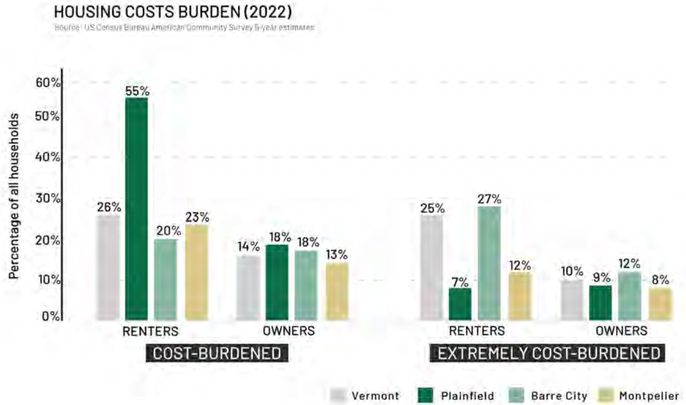
DISASTERS AMPLIFY EXISTING HOUSING CRISIS





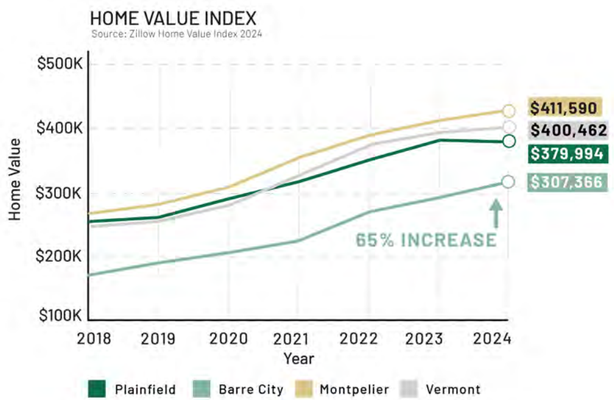






COST-BURDENED:
Spending **30-50%** of your income on housing costs

EXTREMELY COST-BURDENED:
Spending **over 50%** of your income on housing costs



BARRE FLOOD RESILIENCE PLAN

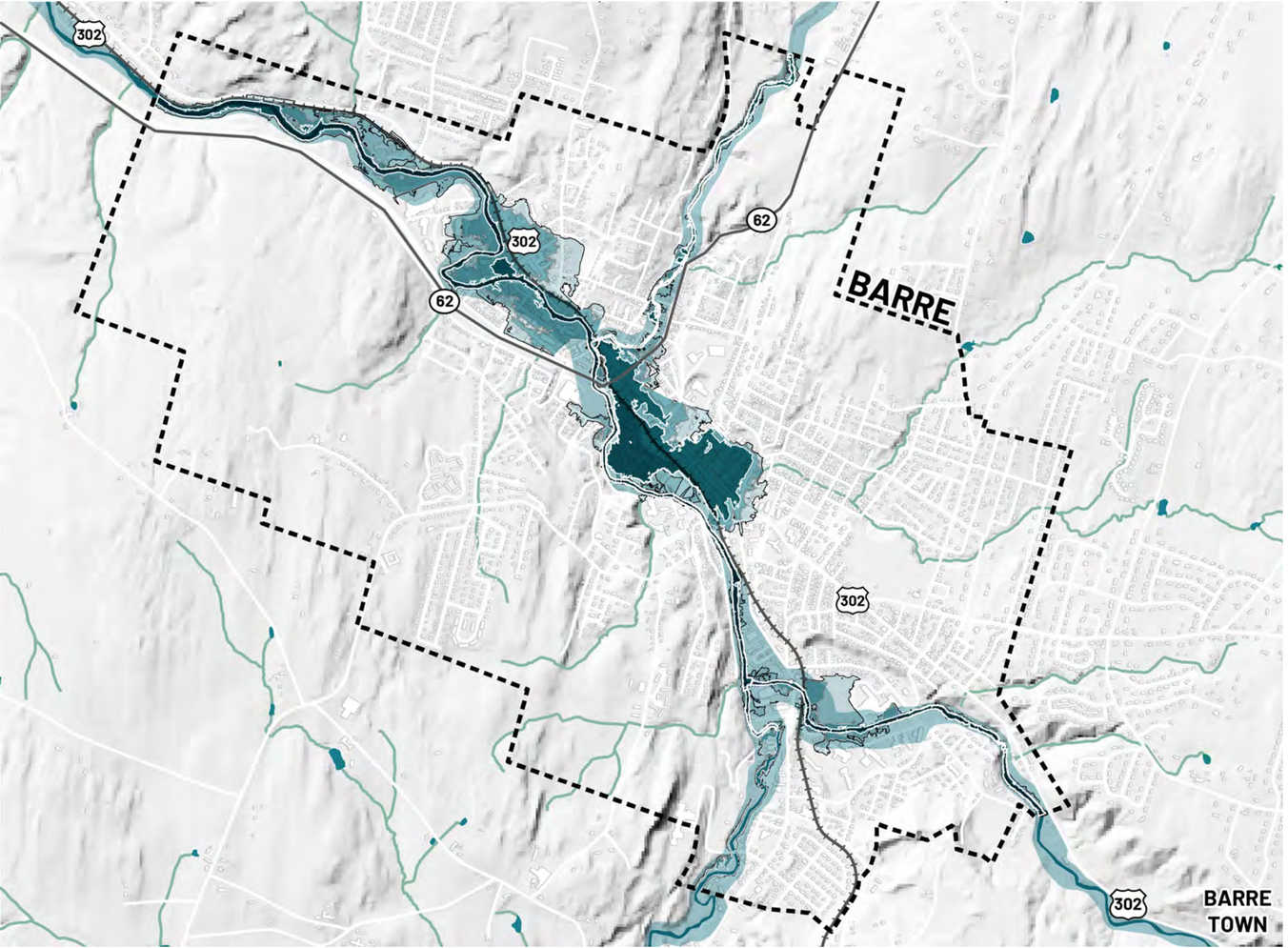
EXECUTIVE SUMMARY

Barre faces an urgent need to address its vulnerability to flooding. The Barre Flood Resilience Plan provides a comprehensive strategy to mitigate these risks while revitalizing the city through adaptive infrastructure, housing diversity, and green open spaces. Leveraging FEMA buyouts, underutilized land, and collaborative partnerships, the plan outlines a pathway to ensure the city's long-term sustainability and resilience.

The plan is guided by three principles: protecting Barre's historic foundation, adapting to new environmental challenges, and fostering growth to support a vibrant future. Key projects include flood-resilient infrastructure upgrades, such as elevating bridges and introducing green stormwater solutions, as well as promoting mixed-use housing and infill development. In addition, the transformation of flood-prone areas into multifunctional public spaces, like the proposed Enterprise Park and the North End Restoration, exemplifies how the city can combine flood mitigation with community enrichment and economic development.`

By addressing both immediate challenges and long-term opportunities, the plan aims to transform Barre into a resilient and connected city. Through innovative policies, strategic investments, and community collaboration, Barre can not only reduce the impact of flooding but also enhance its livability, attract new residents and businesses, and safeguard its historic identity for future generations.

TABLE OF CONTENTS



UVM INUNDATION MODEL

This plan incorporates the University of Vermont's model to assess flood risk comprehensively. While the original model delineates floods into eight categories, ranging from 2-Year to 500-Year events, we have simplified these into three categories—2-Year, 5-to-25-Year, and 50-to-500-Year floods—for greater clarity and ease of interpretation.

Township Boundary

UVM Inundation Model

2-Year Flood

5 to 25-Year Flood

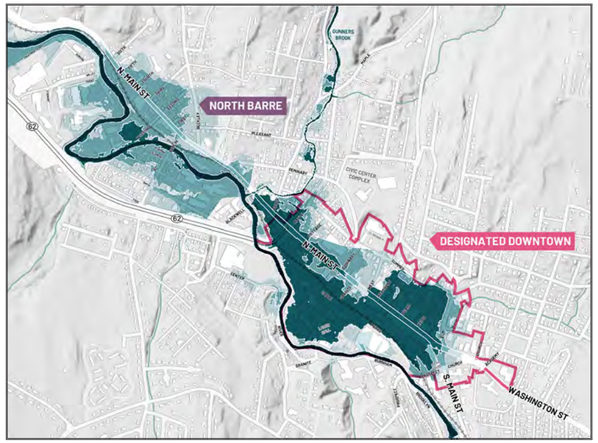
50-500-Year Flood

0 0.25 0.5 Miles

STUDY AREA

The study area was identified based on UVM's inundation model, FEMA-designated hazard zones, and areas with recent flood damage. This area primarily spans North Main Street, stretching from the southeastern designated downtown to the North End. It encompasses Barre's commercial, industrial, and residential hubs, representing the city's core economic and social activity.

While areas outside this study zone are acknowledged, the selected focus reflects the parts of Barre most critical to advancing resilience planning efforts. By concentrating on this key corridor, the plan aims to address the greatest vulnerabilities while fostering long-term sustainability and growth for the broader community.



FLOODING POSES AN EXISTENTIAL RISK TO BARRE

The Main Street corridor is the heart of Barre, yet it is also the most flood-prone area. Its convergence of diverse land uses and activities makes it especially vulnerable, with flooding posing an existential threat to the city's identity, economy, and resilience.

RESIDENTIAL RISK

Even during routine flooding events, over 150 housing units are at risk, with this number rising dramatically in more severe floods. Flooding not only endangers residents but also intensifies Barre's ongoing housing crisis, increasing the risk of displacement and futrther straining Barre's resources.

Total Units Affected:

153 UNITS (4%) of total housing stock in a **2 year flood**

297 UNITS (7.3%) of total housing stock in a **25 year flood**

535 UNITS (13%) of total housing stock in a **500 year flood**

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Residential Buildings

- In Flood Hazard Area
- Not In Flood Hazard Area

0 500 1,000 Feet

North End Residential Damage, July 2024 (VTDigger)

Main Street Inundation, July 2024 (Vermont Public Radio)

COMMERCIAL RISK

A significant portion of Barre's commercial properties is concentrated along the Main Street corridor, leaving them highly vulnerable during flooding events. For many longstanding businesses, flooding poses a substantial financial burden. Some, like Mister Z's in 2023, were forced to close permanently, while others, such as Dente's Market, faced months of recovery efforts to reopen. This ongoing risk threatens the economic stability of Barre's business community.

Total Properties Affected:

158 PARCELS (36%) of total commercial property in a **2 year flood**

211 PARCELS (48%) of total commercial property in a **25 year flood**

246 PARCELS (56%) of total commercial property in a **500 year flood**

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Commercial Buildings

- In Flood Hazard Area
- Not In Flood Hazard Area

0 500 1,000 Feet

MISTER Z'S, 2023

Dente's Market, July 2023

INDUSTRIAL RISK

Barre's industry has historically been centered along its riverfront, leaving much of the city's industrial property vulnerable to flooding. This exposure has forced some businesses to relocate outside the city, resulting in a loss of economic activity and a negative impact on Barre's tax base.

Total Properties Affected:

21 PARCELS (37%) of total industrial property in a **2 year flood**

37 PARCELS (65%) of total industrial property in a **25 year flood**

42 PARCELS (73%) of total industrial property in a **500 year flood**

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Industrial Buildings

- In Flood Hazard Area
- Not In Flood Hazard Area

0 500 1,000 Feet

Post Flood North End, July 2024 (Vermont Public Radio)

PROPERTY VALUE RISK

Flooding poses a substantial financial threat to Barre, with one-quarter of the city's listed real estate value at risk during a 2-year flooding event. This risk escalates significantly during more severe floods, jeopardizing the city's economy and undermining its tax base.

25% of Real Assessed Value in 2-Year Floodplain

UVM INUNDATION MODEL

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

LISTED REAL VALUE / ACRE

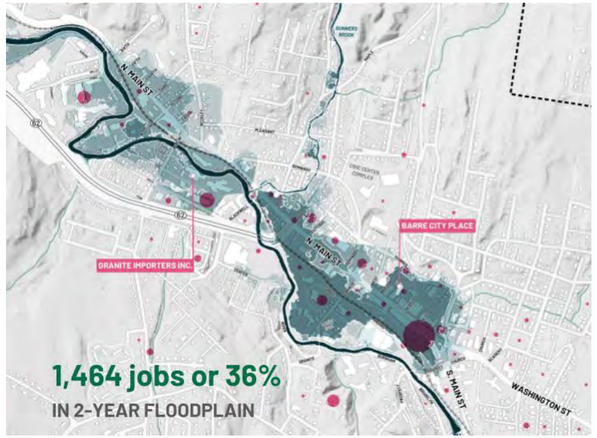
Less valuable

More valuable

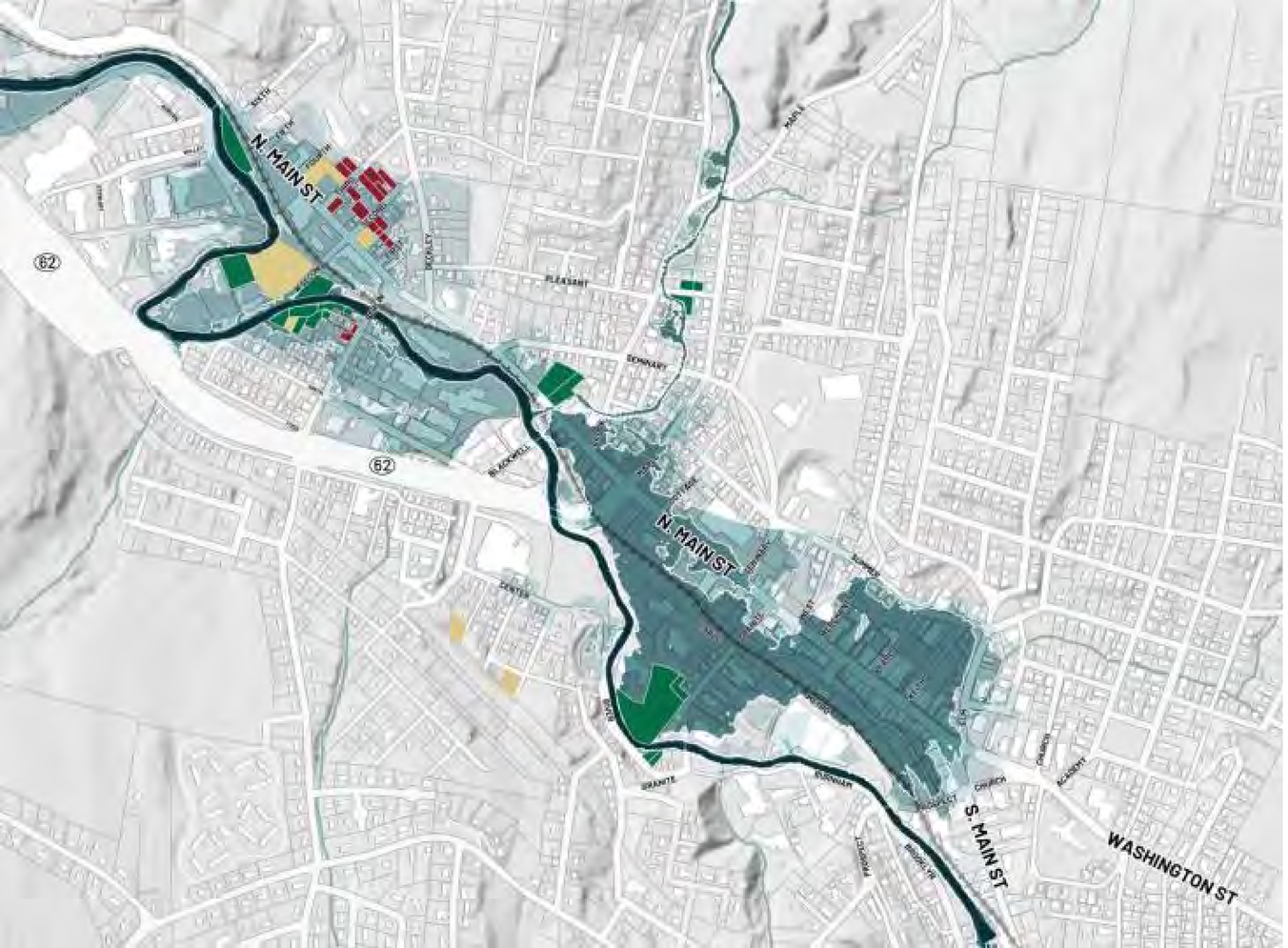
0 500 1,000 Feet

JOB CENTER VULNERABILITY

Barre's job centers are deeply connected to its commercial and industrial sectors, making them—and the livelihoods of their employees—highly vulnerable to the impacts of flooding.



Based on LEHD Census Employment Data



FEMA BUYOUTS

One example of flooding's financial impact on Barre is the city's approach to FEMA buyout proposals. While Barre has received numerous buyout proposals, many remain pending or under consideration. FEMA's policy prohibiting redevelopment on bought-out land presents a dilemma, as losing taxable properties could further strain the city's finances.

As a result, Barre has denied several buyouts—typically for properties farther from the river—to preserve their potential for future development. This places the city in a difficult position, balancing the needs of its residents with the financial stability required to sustain its long-term growth.

VISION

A strong Barre is supported by resilient infrastructure and anchored to its revitalized waterfront, where diverse housing and economic opportunities provide a home for all.

PRINCIPLES

PROTECT
barre's foundation

ADAPT
for resilience

GROW
for tommorow

Our plan is built around three central principles that guide its proposals. Barre's rich history, strong institutions, and sense of identity must be protected to preserve its foundation and ensure the city can thrive under future challenges. At the same time, Barre must embrace change, rethinking outdated development patterns and adopting innovative approaches to better organize its resources, land, and community assets. Finally, growth is essential—supporting displaced residents, attracting young professionals, and welcoming diverse groups while expanding Barre's tax base, businesses, and housing to build a resilient, sustainable future.

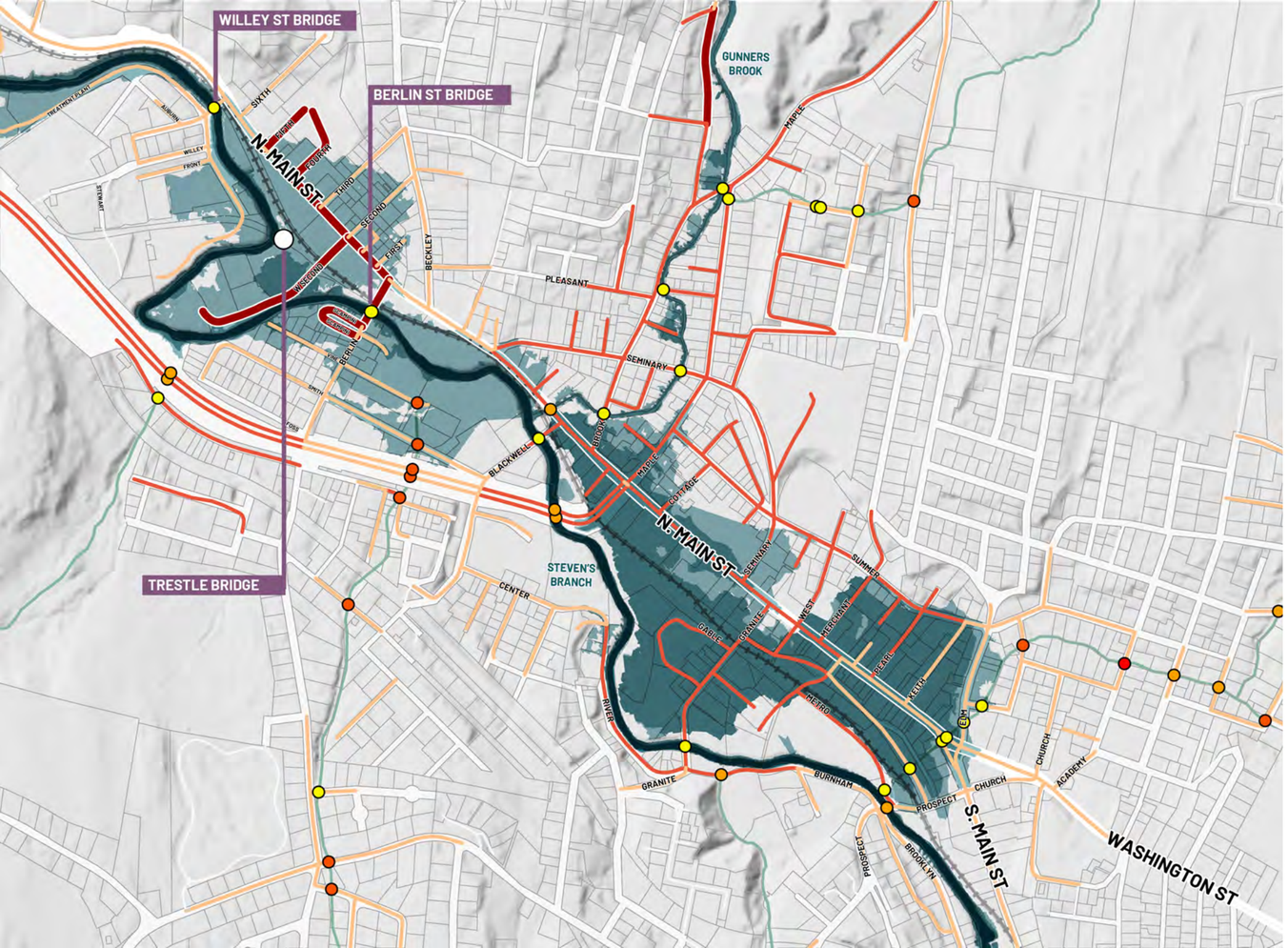
ACTIONS

IMMEDIATELY TACKLE CRITICAL INFRASTRUCTURE ISSUES

DIVERSIFY AND FORTIFY HOUSING OPTIONS

TRANSFORM WATERRONT LAND INTO RESILIENT OPEN SPACES

CREATE ECONOMIC OPPORTUNITY THROUGH CHANGE & INNOVATION



INFRASTRUCTURE RISK

According to the VTrans Resilience Planning Tool, many of Barre's roads, bridges, and culverts are classified as high risk. The roads in the North End are particularly vulnerable to flooding damage, posing a significant challenge due to their critical role in maintaining transportation network connectivity.

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Roads

- High Risk
- Medium Risk
- Low Risk

Bridges & Culverts

- High Risk
- Medium Risk
- Low Risk

0 500 1,000 Feet

CULVERTS

Several culverts in Barre are too narrow to handle the water volume during flood events, causing floodwaters to back up and inundate upstream neighborhoods.

BERLIN STREET BRIDGE

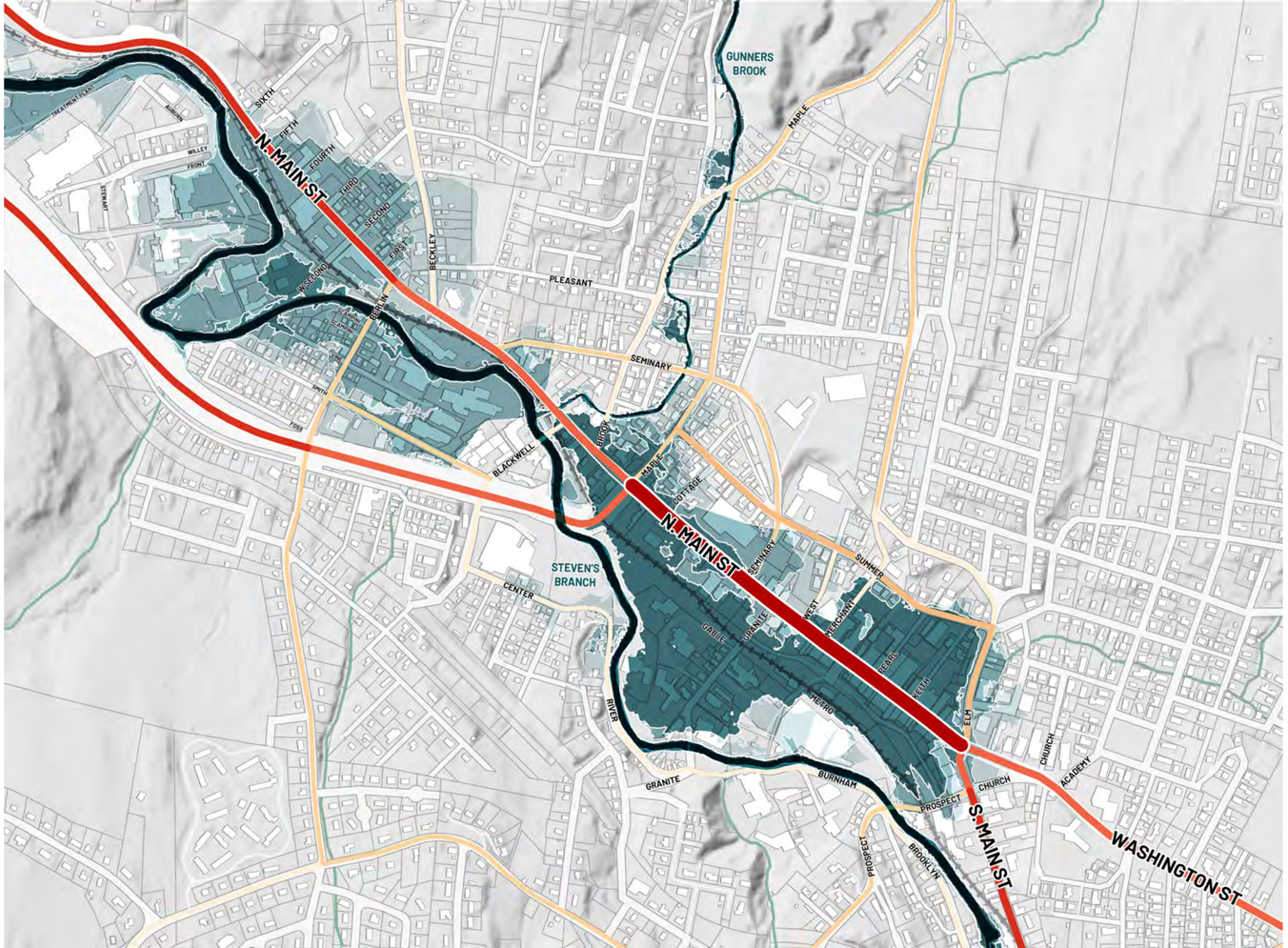
The Berlin St. Bridge's shallow design causes debris to accumulate, redirecting floodwaters into the surrounding neighborhood and exacerbating flood impacts in the area.

TRESTLE BRIDGE

The multiple structural members of the freight rail trestle bridge trap debris during flood events, intensifying flood damage in the surrounding areas. Additionally, the bridge serves only one industrial site.

TRAFFIC VOLUMES

Most of Barre's traffic is concentrated in the downtown area along North Main Street, which lies almost entirely within the 2-Year flood zone and is highly prone to flooding. Protecting this critical stretch is essential to prevent business closures, and alternative transportation routes must be established to ensure connectivity during emergency flooding conditions.



UVM Inundation Model

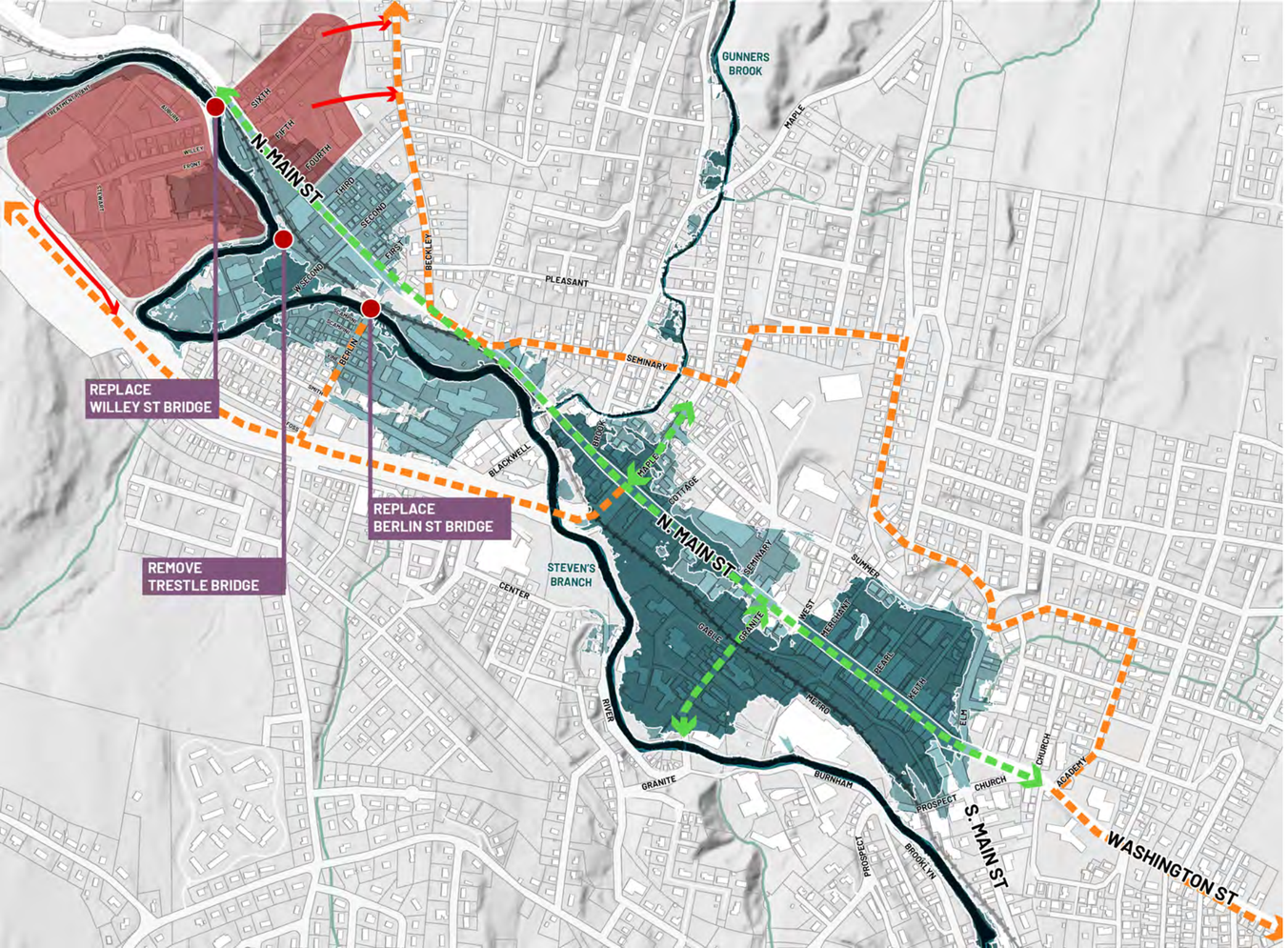
- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Average Annual Daily Traffic

- <2500
- 2500 - 5000
- 5000 - 7500
- 7500 - 10000
- 10000 - 12500
- >12500

0 500 1,000 Feet

Source: Jeb Wallace-Brodeur, 2023, Rutland Herald.



INFRASTRUCTURE RECOMMENDATIONS

BRIDGE ADAPTATIONS

Our recommendations focus on adapting Barre's infrastructure to better manage the increasing impacts of flooding. This includes elevating the Willey Street Bridge, removing the trestle bridge, and replacing the Berlin Street Bridge with an elevated pedestrian bridge to improve water flow and prevent debris accumulation.

ALTERNATE TRANSPORTATION NETWORKS

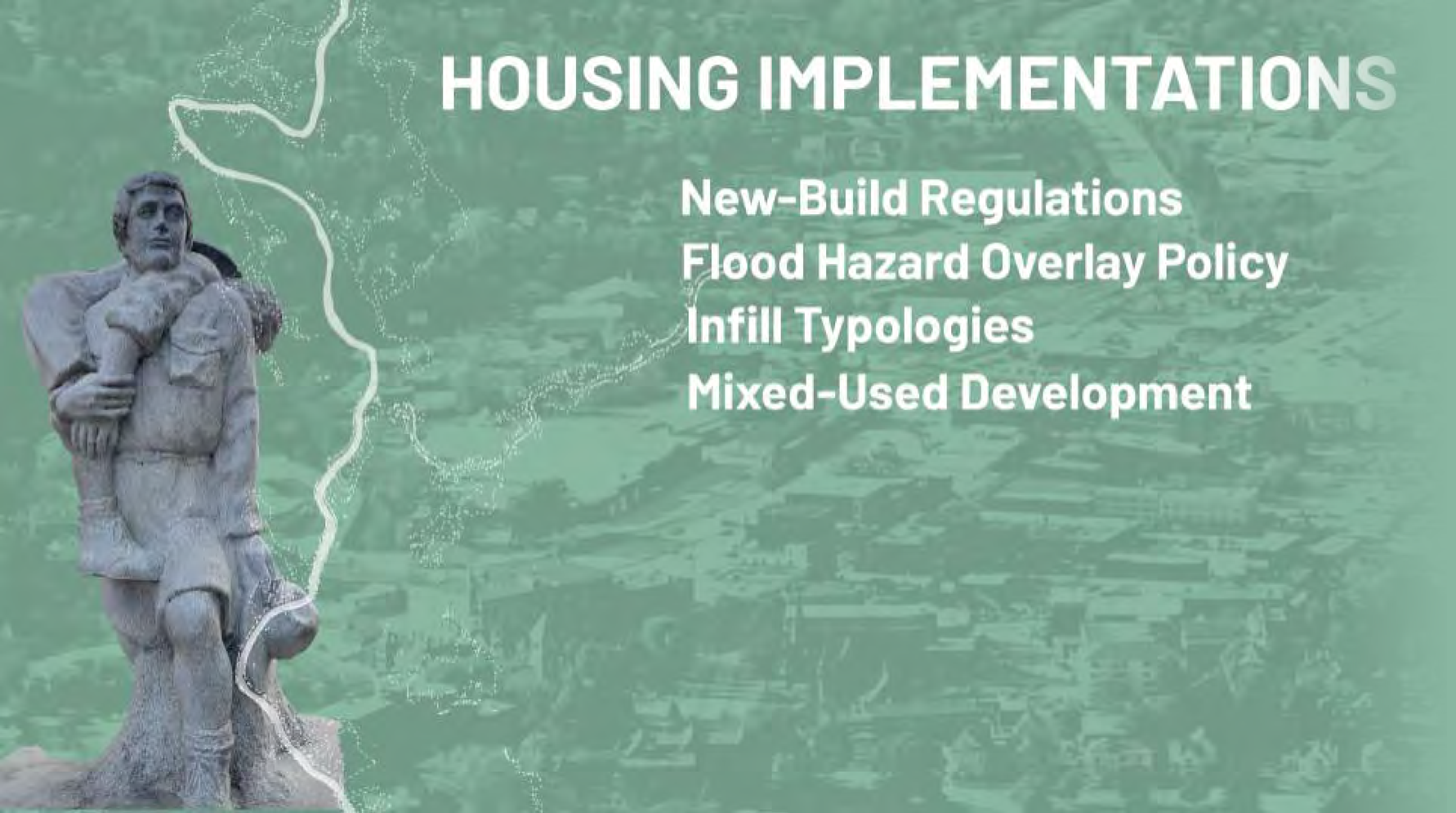
To ensure connectivity during severe flood events, alternate transportation networks need to be identified and developed, with routes designed to handle emergency vehicles. Particular attention is needed in the North End, where heavy flooding could leave the area completely isolated without new connections to alternate access routes.

- Bridges
- Stranded Neighborhoods
- Alternate / Evacuation Routes
- New Road Connections
- Green Stormwater Streets

0 500 1,000 Feet

GREEN STORMWATER STREETS

Additionally, green stormwater infrastructure, such as rain gardens incorporated into bulb-outs at intersections along North Main Street, is proposed to help absorb and manage floodwaters. These interventions, modeled on successful implementations in Burlington, Vermont, aim to protect the downtown area while enhancing Barre's overall flood resilience.



HOUSING IMPLEMENTATIONS

New-Build Regulations
Flood Hazard Overlay Policy
Infill Typologies
Mixed-Used Development

Barre can protect, adapt, and grow its housing stock by implementing flood-resilient design regulations for new construction and promoting diverse housing options, including multifamily infill projects and mixed-use developments.

HOUSING ASSESSMENT

The plan's housing proposals focus on enhancing resilience and diversity in Barre's housing stock. These proposals are informed by data collected on-site in October 2024 and insights from CVRPC's infill housing analysis.

BUILDING CONDITION

Excellent Facade, clean and tidy outdoor space, No visible damages

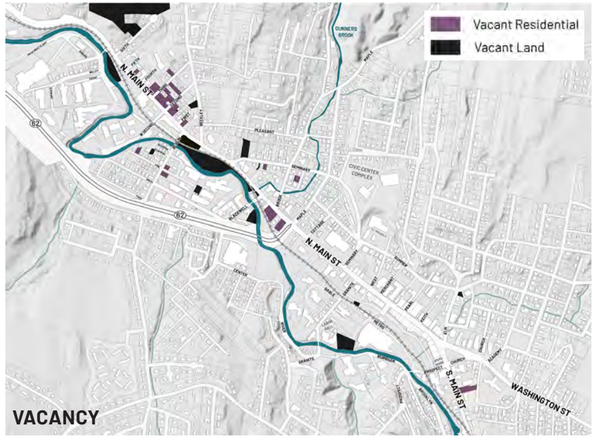
Good overall, needs minor cosmetic repair and facade updates

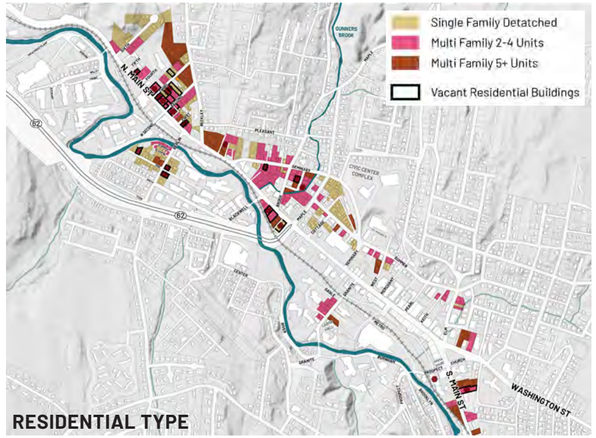
Poor condition and in need of structural repairs like new roof, porch, windows, or fixtures

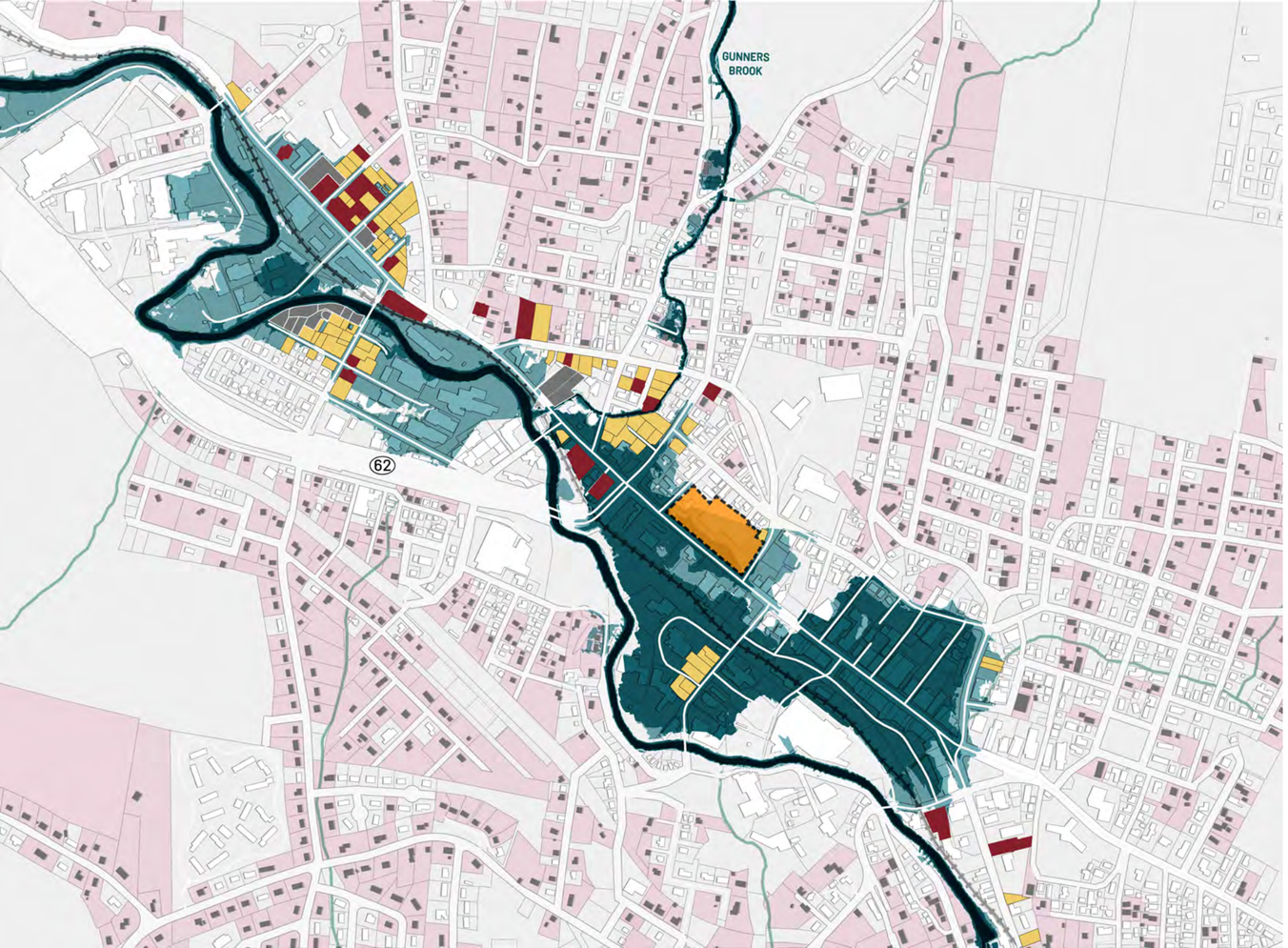
Uninhabitable living conditions and dangerous structure

- Excellent Condition
- Good Condition
- Poor Condition
- Failing Condiition

0 500 1,000 Feet







HOUSING STRATEGY

The strategy focuses on creating a resilient and diverse housing stock by addressing flood risks and leveraging opportunities for redevelopment.

GOALS

Protect and Adapt Existing Properties
for flood reslience

Increase Housing Stock
to support local business and tax base

Improve Diversity of Housing Types
to support diverse demogrpahics

Buyouts

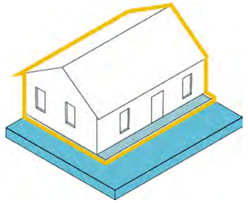
Flood Proof & Repair

Infill Housing

Accessory Dwelling Units

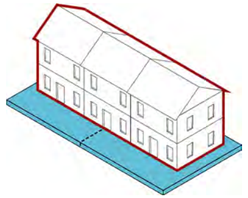
Mixed Use Development

0 500 1,000 Feet



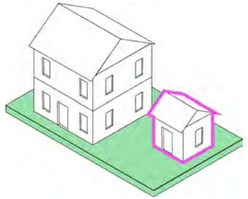
Flood-Prood & Repair

Homes in the floodplain require assistance to flood-proof homes for future floods and execute repairs on homes damaged during the recent floods.



Infill Housing

Lots in the floodplain that have been rendered uninhabitable and are vacant that are not being considered for buyouts must be used to incrementally build missing middle housing.



Accessory Dwelling Units

Making it easier to build ADUs on lots with a low ground coverage outside the floodplain is an easy method to increase the number of housing units in Barre.

Mixed Use Developments

Underutilized commercial establishements, especially ground level structures with excess parking should be considered for building mixed use structures fronting the street to increase the housing stock without reducing commercial space and improving the character of the street.

FLOOD HAZARD OVERLAY DISTRICT

Barre's zoning and building regulations currently address issues of flooding and stormwater through land use regulations such as conservation districts and riparian buffer regulations, which regulate development in particularly vulnerable areas of the city, and impervious surface and stormwater system design guidelines, which help control stormwater. Barre does not, however, currently require buildings to be designed to accepted floodproofing standards.

The district, which encompasses all areas of the city within the 500-year floodplain, will require all new buildings and any significant alterations to existing buildings to follow floodproofing design standards from FEMA and the Vermont Fire and Safety Building Code. These regulations include, among others, building ground floors above the floodplain, locating utilities on upper floors, and building material choice guidelines.

The flood hazard overlay district will protect and adapt Barre's housing stock and ensure that all future development in the city's most vulnerable areas will be flood resilient.

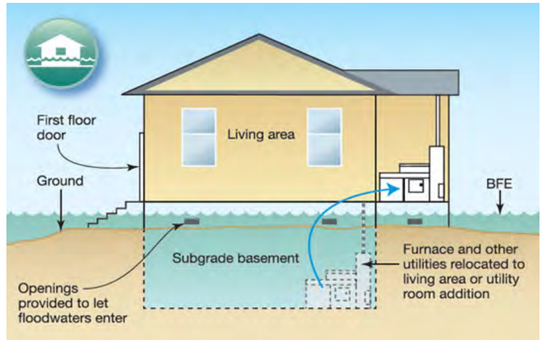
UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

Overlay

- Proposed Flood Hazard Overlay District Boundary

0 500 1,000 Feet



Case Study: City of Montpelier, VT

In 2018, Montpelier adopted River Hazard Area Regulations, which required all buildings within the area to flood damage prevention design standards. The standards are based off of guidelines from FEMA and the Vermont Fire and Building Safety Code. All new buildings and significant alterations to existing buildings are required to follow these guidelines.

Implementing floodproofing regulations into the city's legislation helps the city ensure a more flood-resilient building stock moving

INFILL HOUSING

The Vermont Homes for All Toolkit offers examples for multi-family housing types that can be utilized on infill lots in Barre. These examples can be designed to flood resilient standards to offer safe housing options that are comparable in size and type to much of the housing that has been lost in recent floods.

Side by Side

This variation on the Side by Side base model results in a shallower footprint suitable for properties that are shallow or have environmental constraints (such as steep slopes, streams, wetlands, and floodplains) that require development to stay close to the street.

Development Metrics	
Number of Units	2 Units
Number of Bedrooms per Unit	(2) 2 Bedroom
Unit Types (Accessible/Age-Friendly)	(2) Conventional
Gross Square Footage per Unit	1,000 sf / 1,000 sf
Building Footprint	25' x 40'

Narrow Lot Four (Base Model)

The slender profile of this four-unit typology makes it suitable for narrow lots and underutilized side yards in places with high demand for one-bedroom units. This typology can work well with a pitched-roof or flat roof form depending on the context.

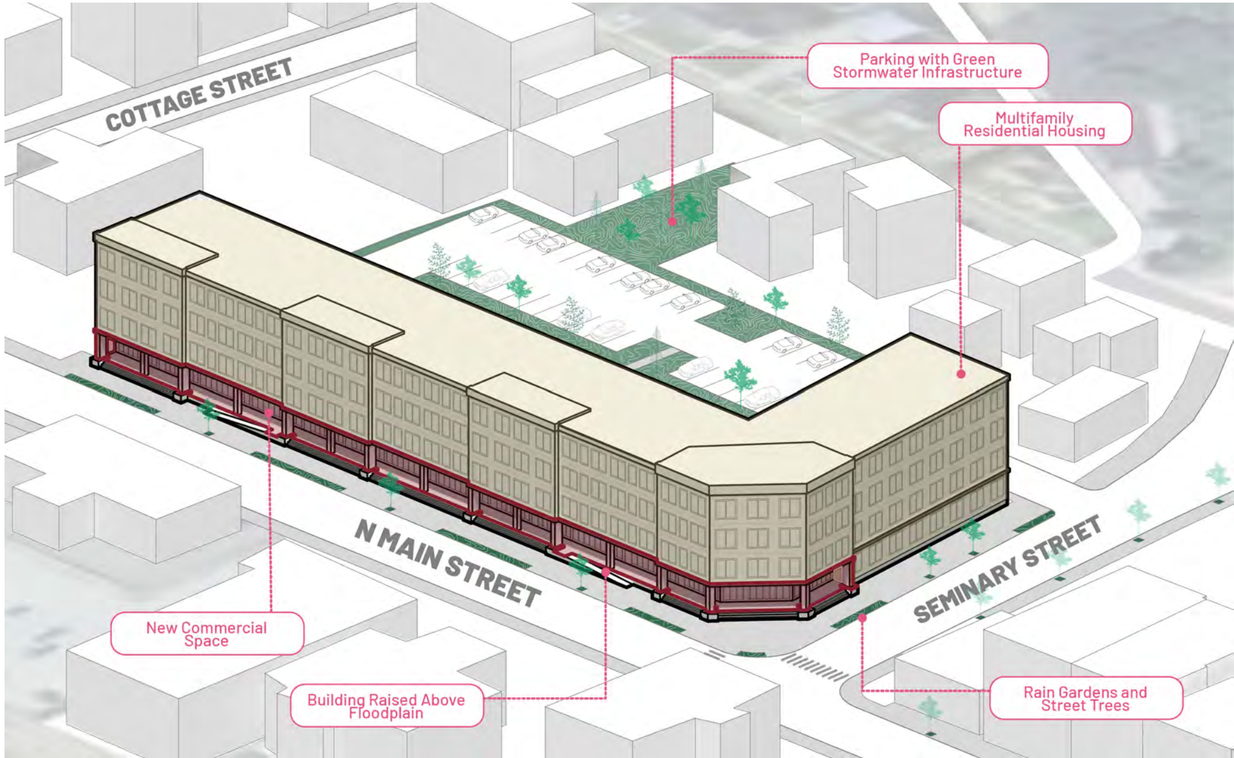
Development Metrics	
Number of Units	4 Units
Number of Bedrooms per Unit	(4) 1 Bedroom
Unit Types (Accessible/Age-Friendly)	(2) accessible, (2) Conventional
Gross Square Footage per Unit	697 sf / 697 sf / 903 sf / 903 sf
Building Footprint	20' x 80'

This home in Montpelier was the inspiration for the Narrow Lot typology.

Alternative: Flat Roof.

MIXED-USE DEVELOPMENT

Barre can develop higher-density housing on underutilized sites along Main Street, such as on sites with excess parking. These sites are close to the main commercial areas of the city and supported by infrastructure most able to accommodate higher density housing. New developments should be developed to add to the built character of Barre's main street, and design to flood resilient standards.



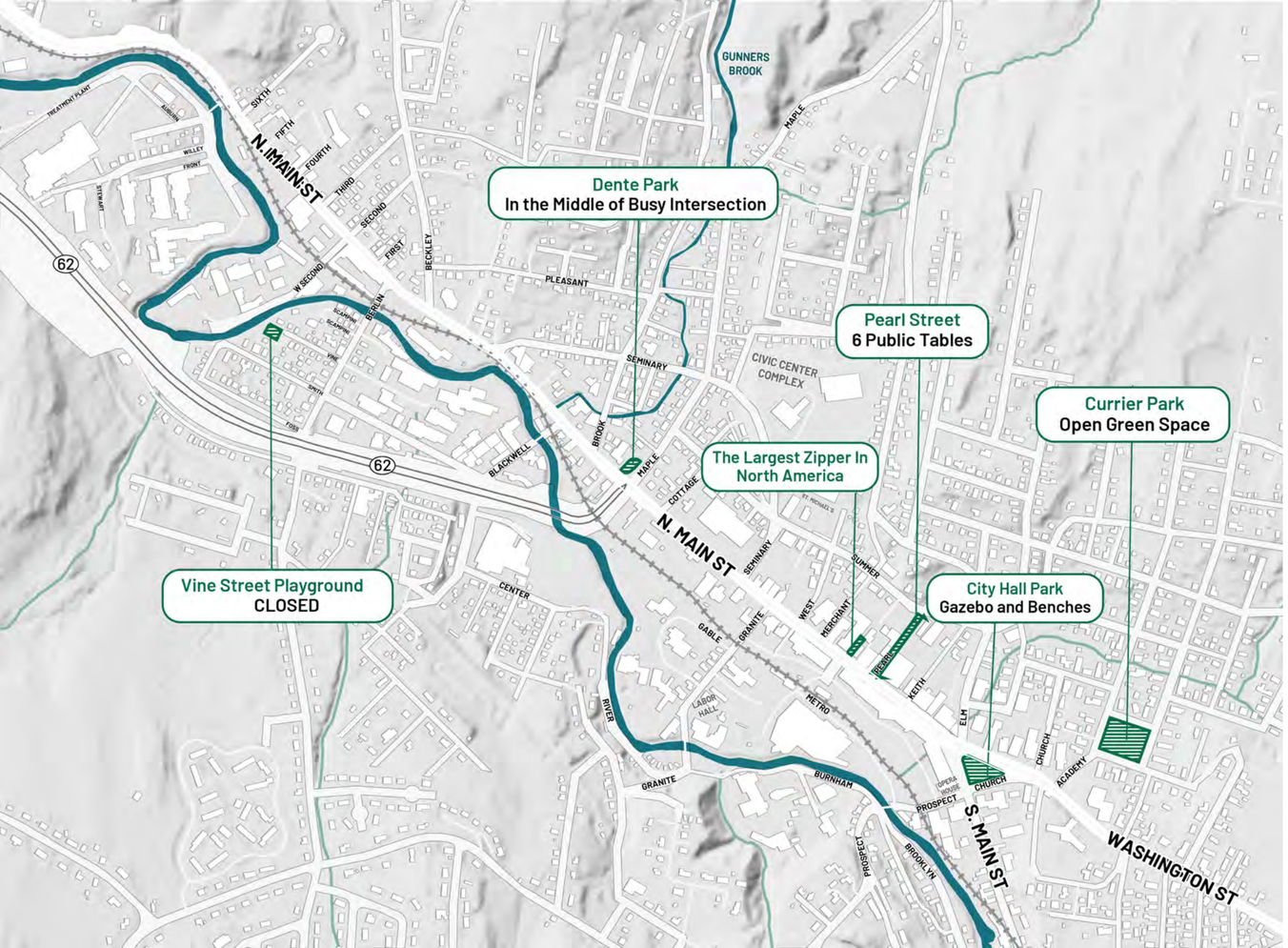
OPEN SPACE PROJECTS

Enterprise Park
North End Restoration
Railway Transformation

Barre can protect, adapt, and grow its housing stock by implementing flood-resilient design regulations for new construction and promoting diverse housing options, including multifamily infill projects and mixed-use developments.

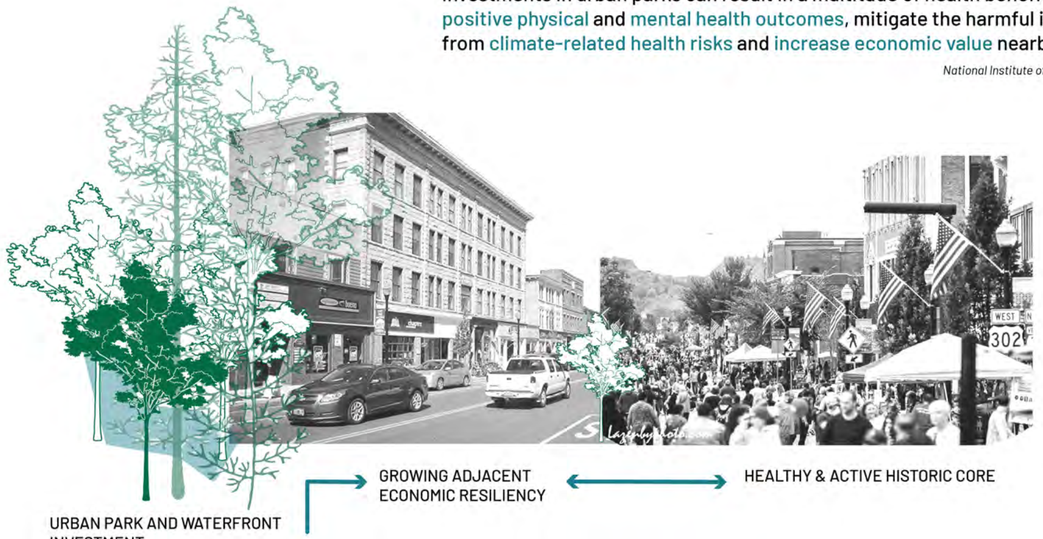
RESILIENT OPEN SPACE

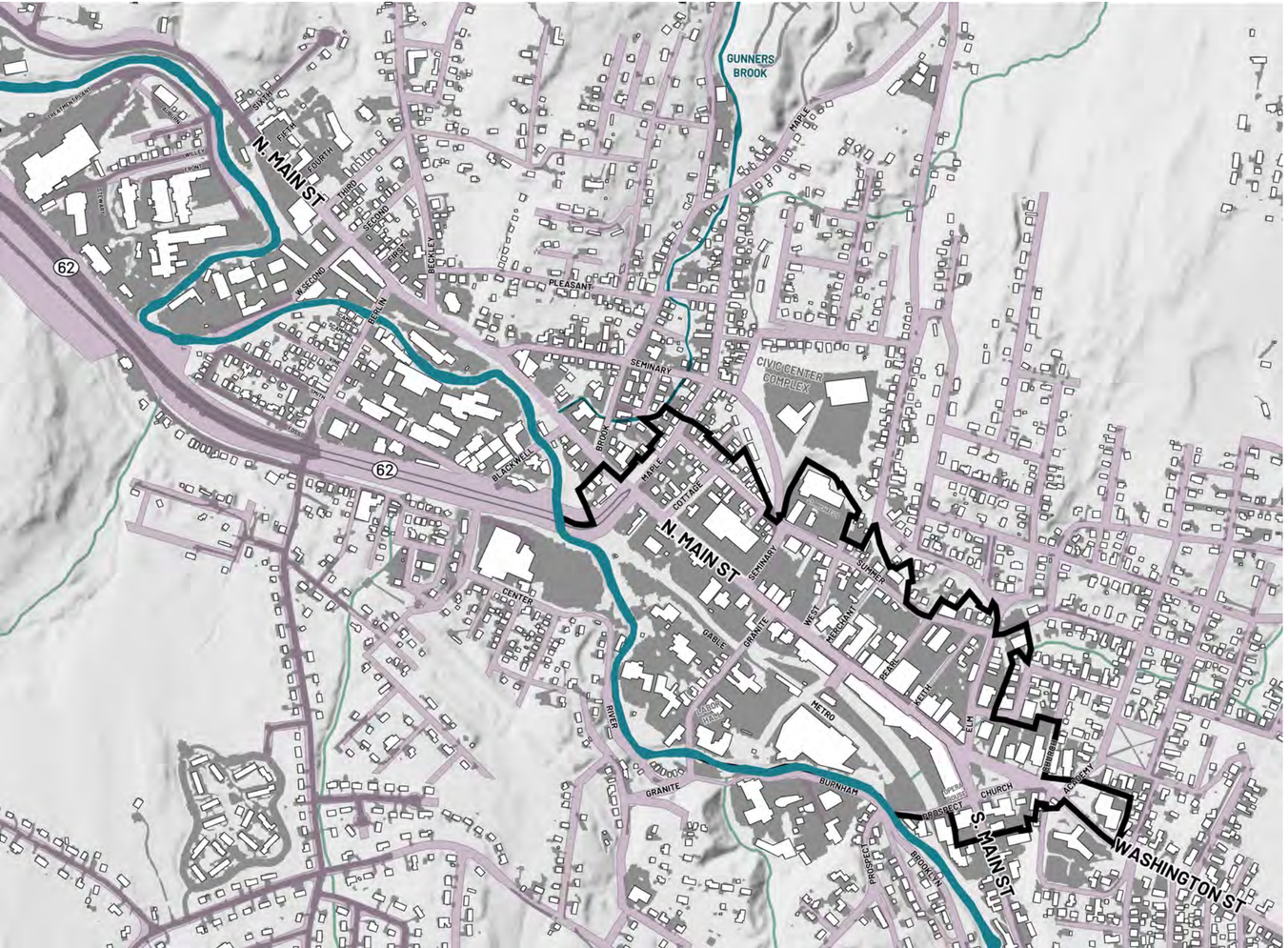
Barre faces both an urgent need and a significant opportunity to address its lack of public greenspaces while transforming its downtown and waterfront land to mitigate flooding. With only a few parks and playgrounds serving the Main Street corridor—and Currier Park being the sole space offering stormwater solutions—there is a clear gap in recreational amenities and resilience infrastructure. Converting vulnerable areas into open spaces not only provides critical stormwater management but also offers health benefits, enhances downtown living, and attracts patrons to Main Street businesses. Viewing this transition as a comprehensive resiliency strategy emphasizes its economic, environmental, and community benefits, paving the way for a more sustainable and attractive Barre.



Investments in urban parks can result in a multitude of health benefits... positive physical and mental health outcomes, mitigate the harmful impacts from climate-related health risks and increase economic value nearby.

National Institute of Health, 2023





Parking Lot / Driveway / Sidewalk

Roads (Asphault)

Structures

Designated Downtown

0 500 1,000 Feet

IMPERVIOUS SURFACES

On a broader scale, Barre's reliance on impervious surfaces is a significant challenge. Downtown alone sees 85% of its area categorized as such, creating conditions that allow floodwaters to spread quickly and uncontrollably. This is particularly concerning in high-risk zones around Main Street and the river branch, where the concentration of impermeable surfaces compounds the city's flooding issues.

Reimagining spaces like this parking lot presents an opportunity to not only mitigate flooding but also to create multi-functional areas that serve the community more effectively. By incorporating trees, permeable surfaces, and thoughtful design, Barre could transform these underutilized spaces into assets that support resilience, enhance downtown living, and contribute to a greener, more sustainable future.

PUBLIC PARKING LOTS

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METHODOLOGY FOR ASSESSING OPEN SPACE OPPORTUNITIES

Our approach to identifying parcels and properties suitable for transformation into resilient open space begins with land acquired through the **FEMA buyout properties** program**.** These properties, which will remain undevelopable and under the city's control, form the foundation of our assessment. Among these, the focus is on the north end—the hardest-hit neighborhood and the area with the largest concentration of buyout parcels.

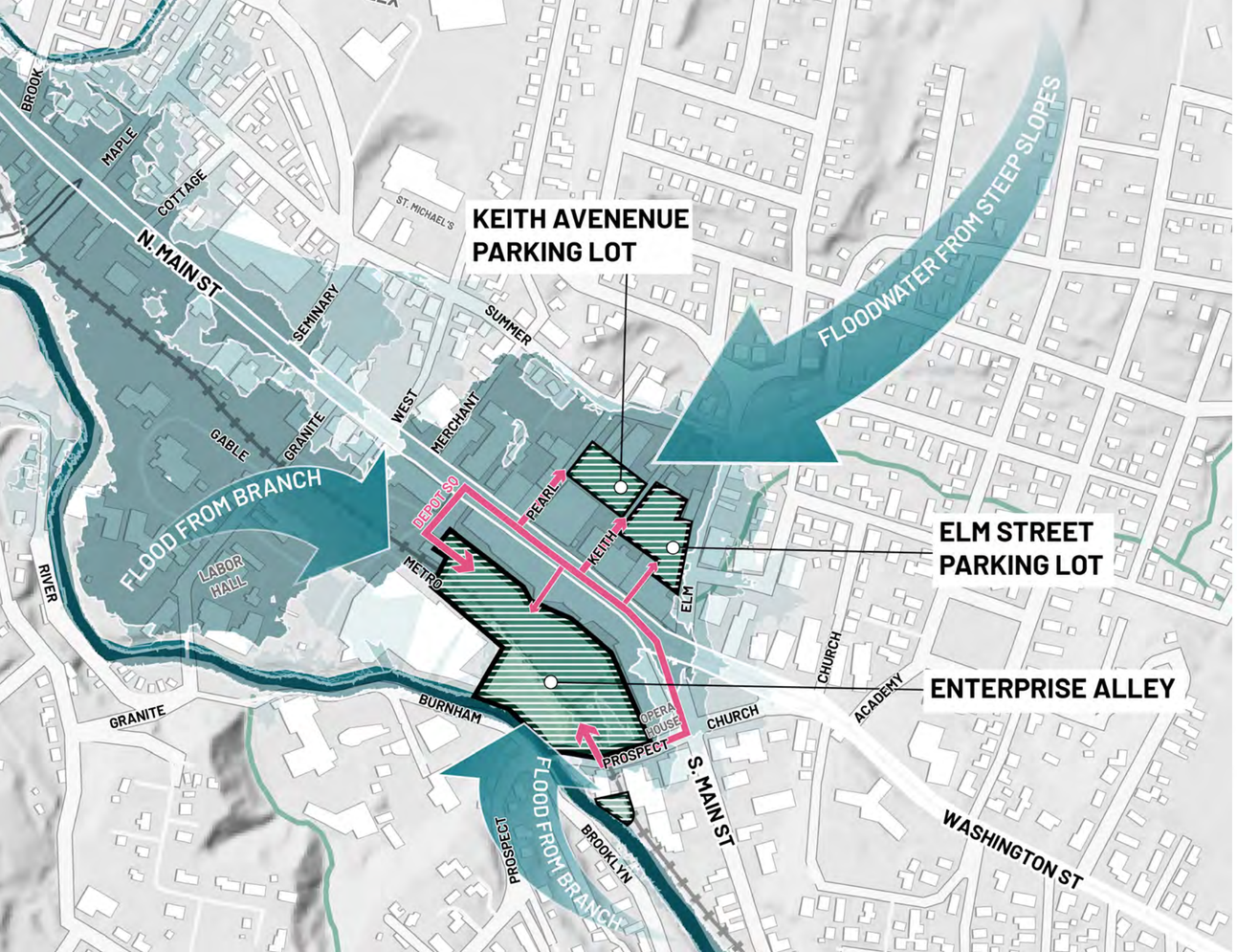
The second category of parcels includes **city-owned parking lots and undeveloped land.** Specifically, public parking lots within the historic district and small vacant properties along the branch's edge offer strategic opportunities for redevelopment. These sites are advantageous due to the city's existing control, enabling the pursuit of solutions without the need for new property acquisitions.

The third category consists of the **state-owned freight railroad**, which spans approximately 26 acres within the study area. Running between Main Street and the branch, this rail line currently operates only about once a month, primarily serving the granite industry. As the industry has shifted to later-stage production, trucks have, in some cases, become a more efficient means of transportation. This underutilized infrastructure presents a significant opportunity for repurposing or complementary uses.

Finally, and most ambitiously, we examined the potential of **occupied and vacant private parcels** along the branch's edge. These properties are at significant risk from future flooding and could serve as critical links in a comprehensive open space system. This approach recognizes the essential role these parcels could play in building a resilient, connected, and sustainable future for Barre.

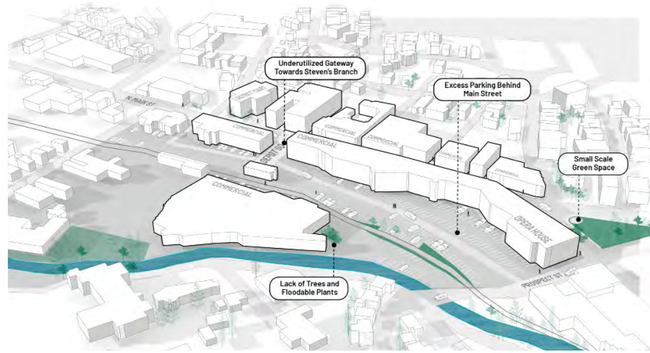
- Existing Parks and Open Spaces
- Approved & Pending Buyouts
- City-Owned Parking & Undeveloped Land
- State-Owned Railroad
- At-Risk & Strategic Private Properties

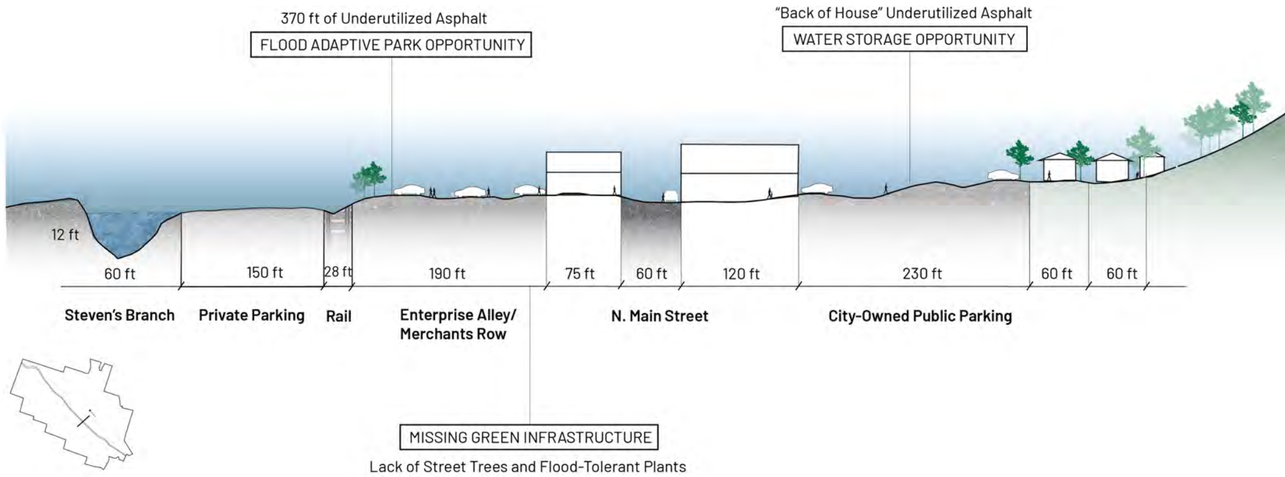
0 500 1,000 Feet

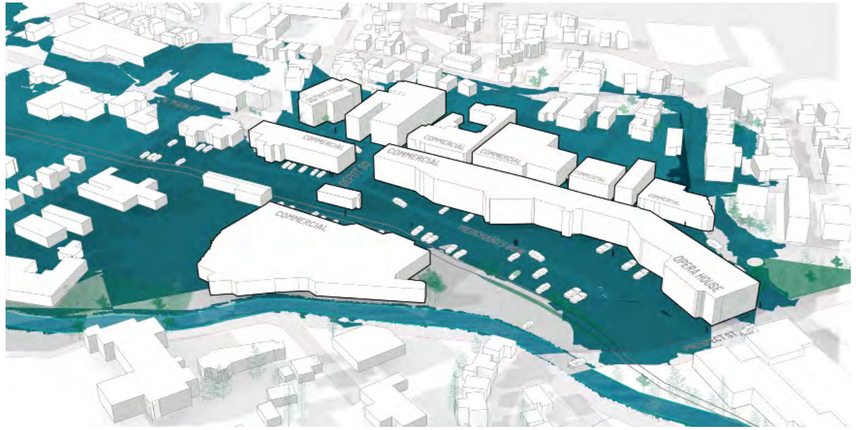


ENTERPRISE ALLEY

Currently dominated by impervious asphalt with minimal green infrastructure, the area exacerabates flooding and misses water retention or storage opportunity. By reimagining Enterprise Alley as a park, complete with flood-tolerant plants, water retention features, and green infrastructure, Barre can reduce flood risks, improve connectivity to the river, and create a vibrant public space that benefits both the environment and the community.

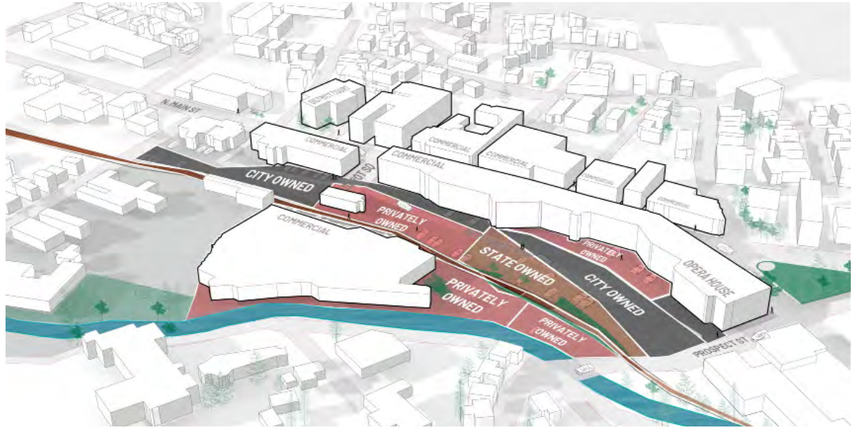






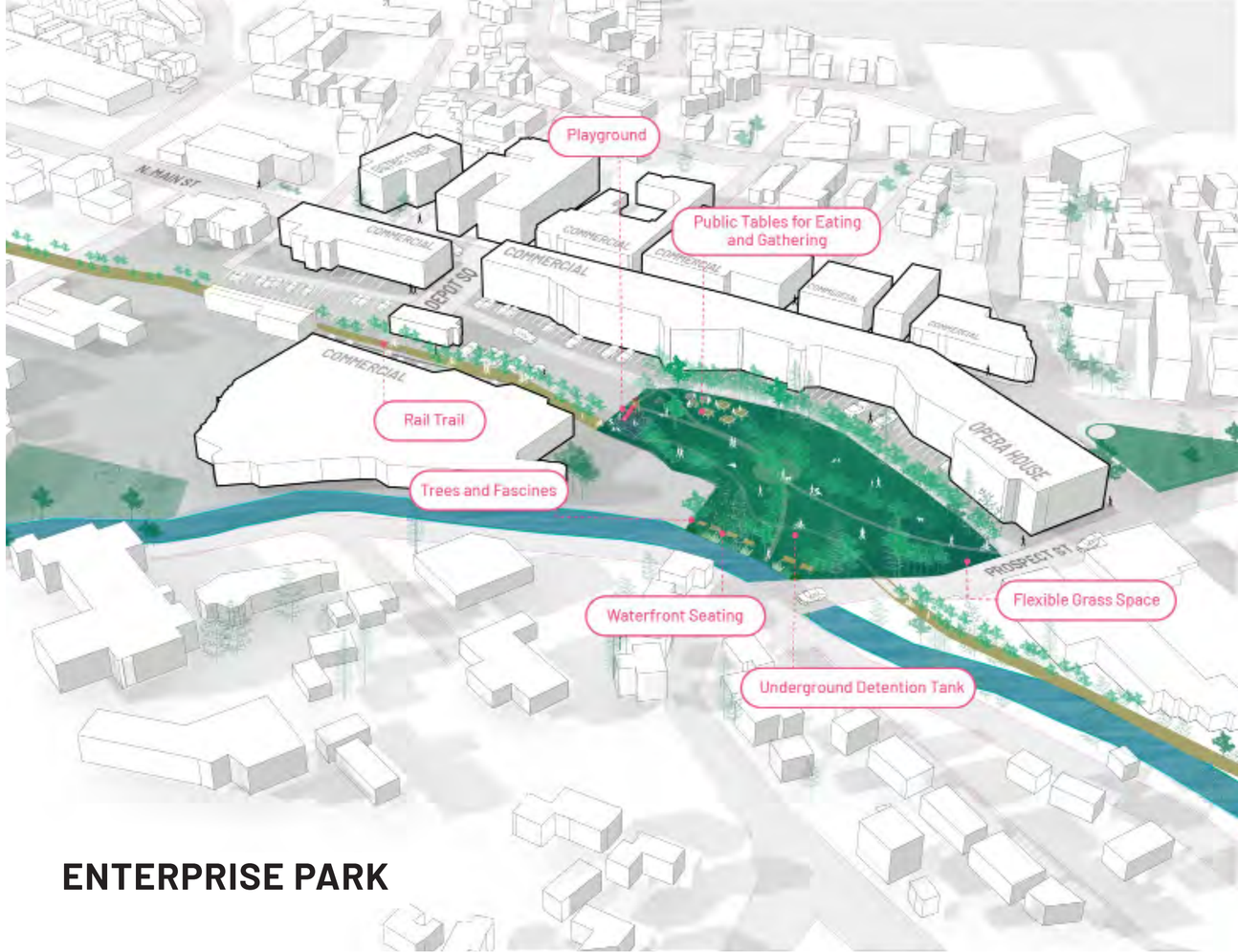
2-YEAR FLOOD

According to UVM's model, there is a 50% chance of a flood of this severity occurring every year. In such events, Enterprise Alley is entirely inundated, along with significant portions of the adjacent Main Street area; highlighting the urgent need for flood-adaptive interventions to mitigate risks and protect these critical downtown spaces.



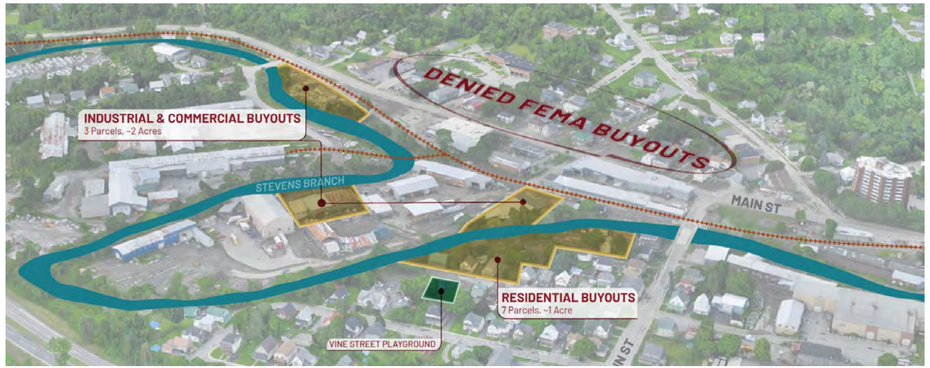
PARCEL OWNERSHIP

Collaboration between the city, state, and private stakeholders will be essential to coordinate land use, secure permissions, and implement the proposed changes. Successfully navigating these partnerships is critical to realizing the vision of a resilient, multifunctional public space in this key downtown area.



ENTERPRISE PARK

NORTH END TODAY



BUYOUTS

Ten FEMA buyouts have been approved here, highlighting the severity of damage to residential properties. North of Main Street, the City chose to preserve tax base and ensure possibility for future development by denying buyouts. The restoration plan hopes to protect those plans.

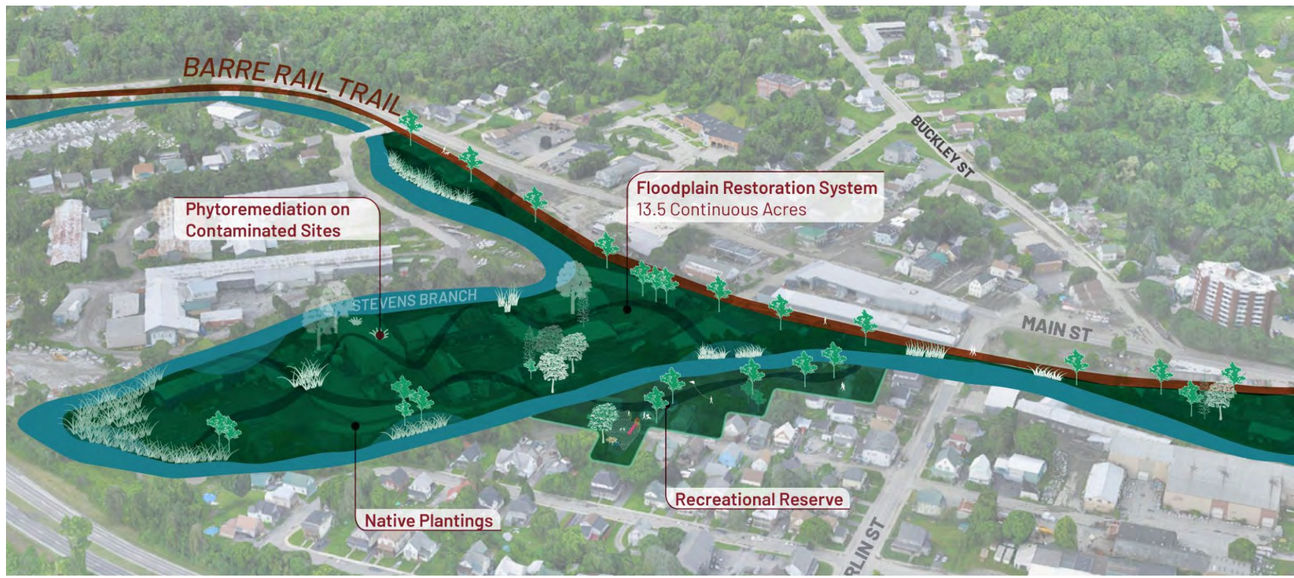
STRATEGIC PARCELS

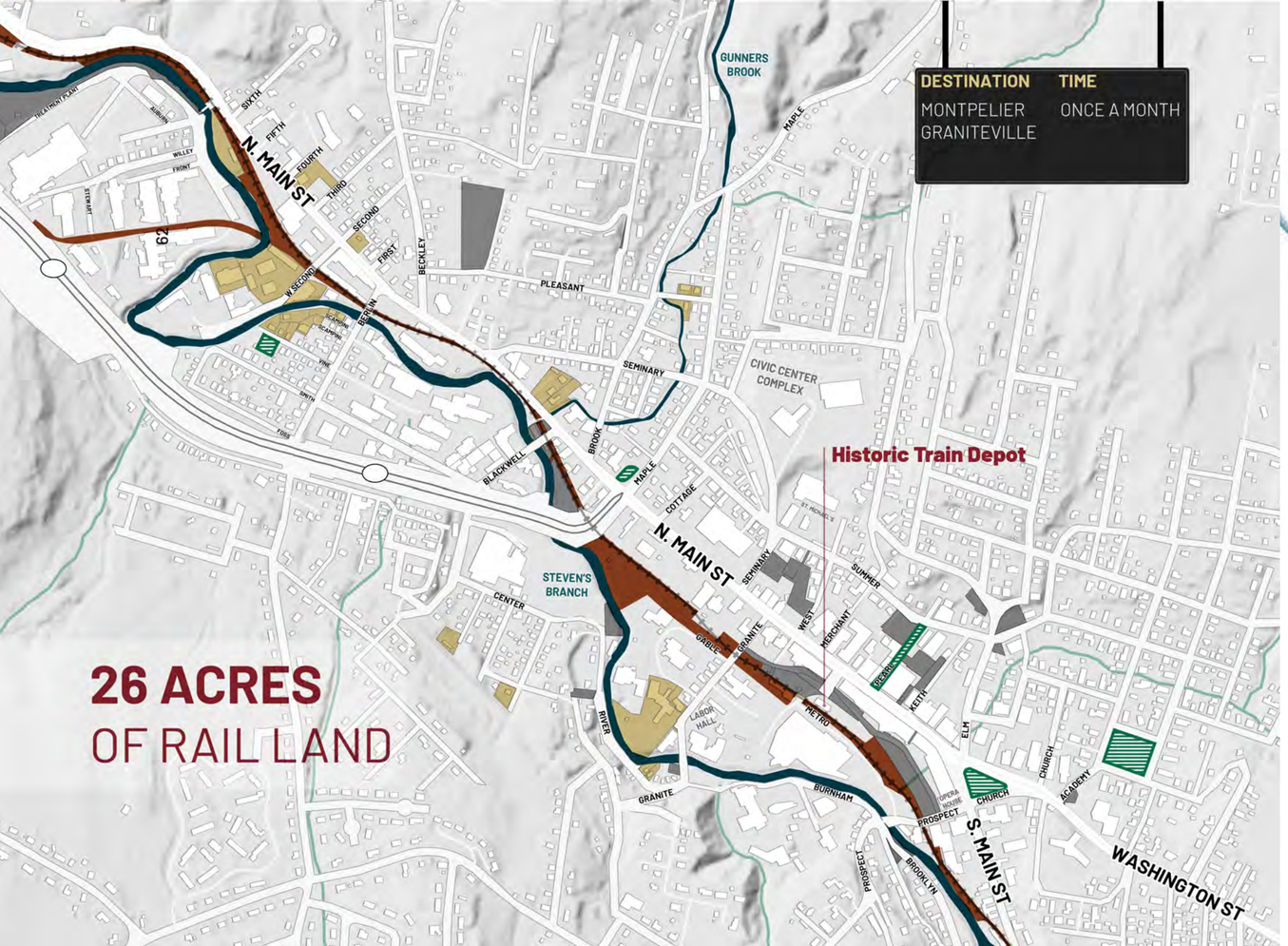
The remaining parcels in the oxbow consist of a mix of industrial and commercial uses and a large vacant property at 450 North Main.

NORTH END RESTORATION

The Restoration focuses on transforming this flood-prone area into a resilient, floodplain restoration and retention system. Nearby proposals include removing two troublesome bridges, raising the Wiley Street Bridge, and disaster relief to damages residences. South of the river, efforts would center on enhancing recreational spaces, such as renovating the Vine Street Playground. In Phase 2 and 3, vacant industrial sites would be converted into an expanded floodplain north of Stevens Branch, creating a 13.5-acre natural reserve system.

Features like native plantings, phyto-remediation of contaminated sites, and softened riverbanks would mitigate flood risks, support downstream areas, and make the North End more attractive for residents. The plan is aware of Barre's concerns over grand list value. The entirety of the proposal would see $2.6 million or 0.3% of real assessed value removed from Barre's grand list.





RAILWAY TRANSFORMATION

Connection to Montpelier

The Railway's connection to the capital's activity, jobs and institutions provides an incredible regional economic opportunity.

Floodplain Restoration

This transformation would most importantly free up roughly 26 acres (within Downtown Barre) for floodplain restoration; helping to mitigate floods, improve water quality and restore natural habitats.

Cross Vermont Trail

The state's preeminent trail system could connect directly to the Barre Rail line, creating a more holistic network.

Connecting Institutions

The historic train depot, Granite Musuem and a number of public schools are directly adjacent to the rail line. Activity generated from the trail would directly support these pillars of town.

Granite Quarries

The quarries' current reliance on freight rail to move granite is the foremost challenge to the rails-to-trails concept but industry changes could alter this dynamic in the future.

Linking Forests and Greenspaces

The trail would provide access and connection to one of the area's proudest assets, the Barre Town Forest, and link other greenspace and recreation spaces throughout the region.

CONSERVATION EASEMENT
AT GABLE PLACE

The conservation easement proposed would ensure no development on the site and hopefully Increase flood retention capacity through plantings and wetland management. Importantly this option would help get a foothold for the larger resilient system plan but allow the freight service to continue uninterrupted.

Steven's Branch
State-Owned Rail Land
Easement Proposal

THE BARRE RAIL TRAIL

One of the boldest proposals for open space in Barre is the reimagining of the railway corridor, transitioning it into a rails-to-trails solution. This transformative project envisions a trail system connecting key institutions, schools, historic sites, and the Granite Museum.

Converting the railway would free up 26 acres of downtown land—and even more beyond the study area—for floodplain restoration and mitigation. This project would promote healthy lifestyles, sustainable transit, and a new way to draw people to downtown Barre, while also creating opportunities for tree planting and flood mitigation, making the city more resilient and vibrant for the future.

FUNDING OPTIONS

STORMWATER UTILITY FEE

Stormwater management is critical for addressing Barre's flooding challenges, and the implementation of a stormwater utility could provide a sustainable, equitable solution. Drawing from South Burlington's success, a utility could fund vital infrastructure improvements by charging fees based on impervious surface areas, ensuring those contributing more to runoff bear a fair share of the cost. Such a model not only generates revenue but also incentivizes practices that mitigate flood risks, making Barre more resilient to future events.

111 properties (including parking lots, churches, courthouses, railroads and apartments and garages) currently pay **$0 in property taxes**

Activate funding potential of **all 3,350** properties listed in its FY24 Grand List to generate a dedicated revenue stream for flood mitigation.

Case Study: Stormwater Utility Fee
South Burlington, VT

South Burlington, Vermont, established a stormwater utility to address repeated flooding by charging fees based on impervious surface areas and Equivalent Residential Units (ERUs). This utility generates $2.25 million annually from 6,600 accounts, funding projects like detention ponds, culvert replacements, and wetland restorations. The utility's equitable model incentivizes sustainable practices, allowing properties to pay mitigation fees in lieu of implementing on-site stormwater treatment solutions, demonstrating a scalable approach to managing stormwater infrastructure effectively.

TEMPORARY MEASURES

STORMWATER DETENTION TANKS

Portable frac tanks, with a capacity of 21,000 to 50,000 gallons, offer a temporary and flexible solution for managing extreme flooding events. These tanks are most effective when deployed in clusters, where pumps or suction systems can be used to collect floodwater and sediment, helping to mitigate immediate impacts. As an emergency measure, they provide a practical way to address overflow during critical conditions. Potential funding for acquiring these tanks could be sourced from the State Surplus Property Program, managed by the Department of Buildings and General Services, making them a cost-effective option for flood management.

GRANITE CITY HISTORY

Barre's identity is deeply rooted in its rich history and enduring connection to the granite industry, which has shaped its culture, economy, and landscape.

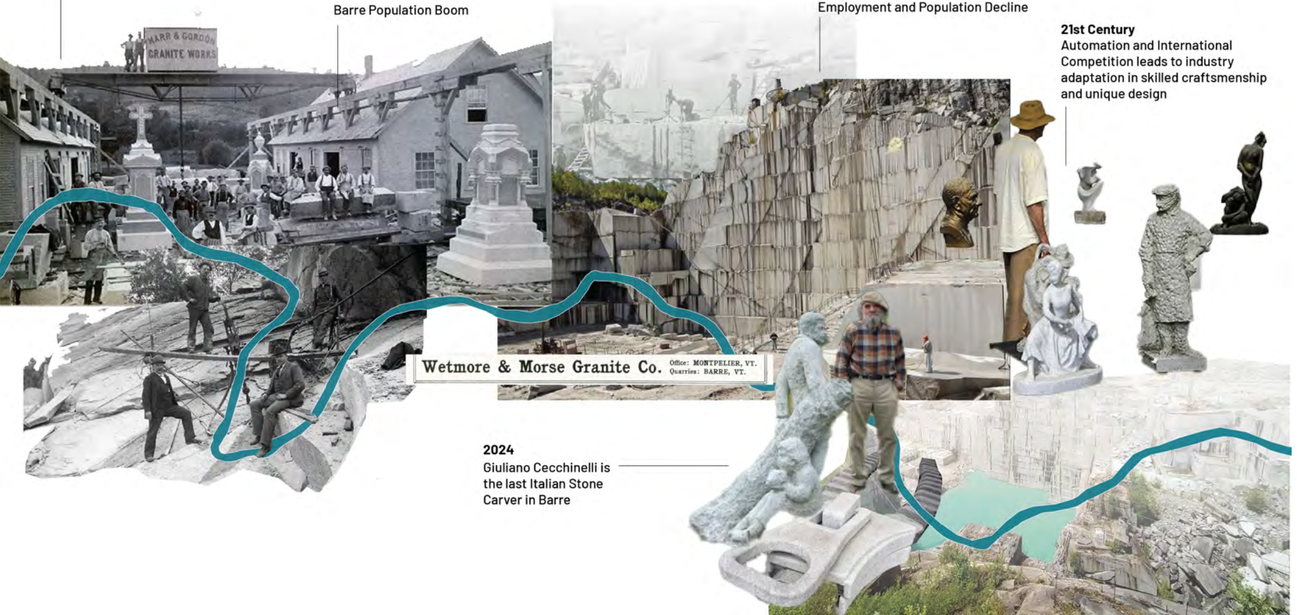
1850-1900
Granite Industry Established

1910
Barre Population Boom

1920s-1980s
Tool Mass Manufacturing and Automation Contributes to Employment and Population Decline

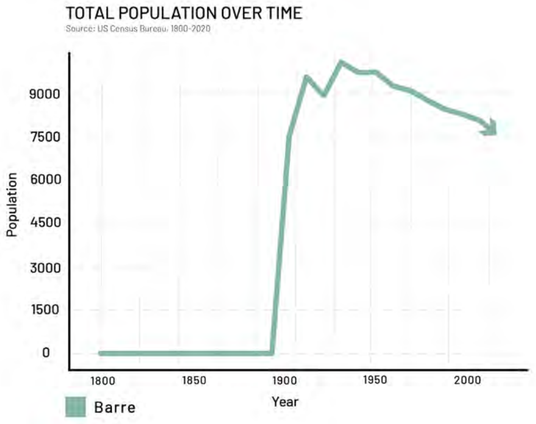
21st Century
Automation and International Competition leads to industry adaptation in skilled craftsmenship and unique design

2024
Giuliano Cecchinelli is the last Italian Stone Carver in Barre

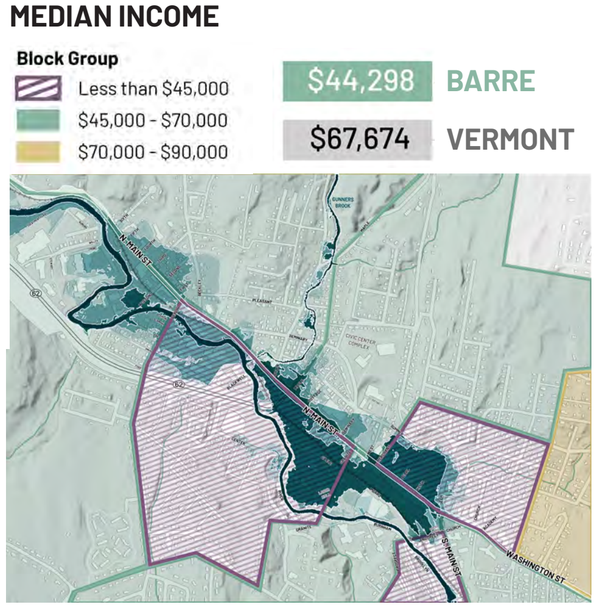


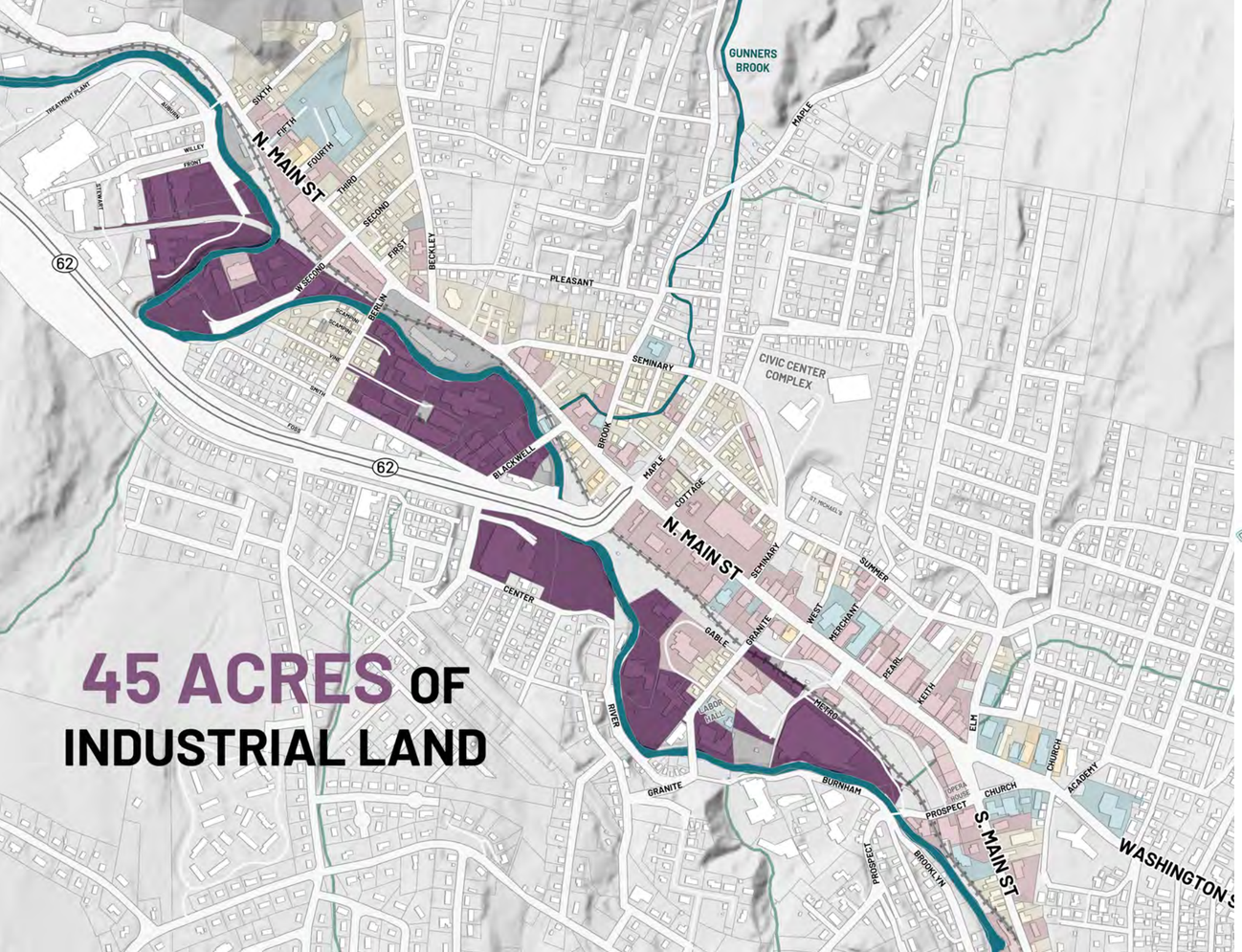
ECONOMIC CHALLENGES

Changes in the granite industry and other economic factors have led to a steady population decline in Barre, resulting in financial hardships for the township and a median income below the state average.



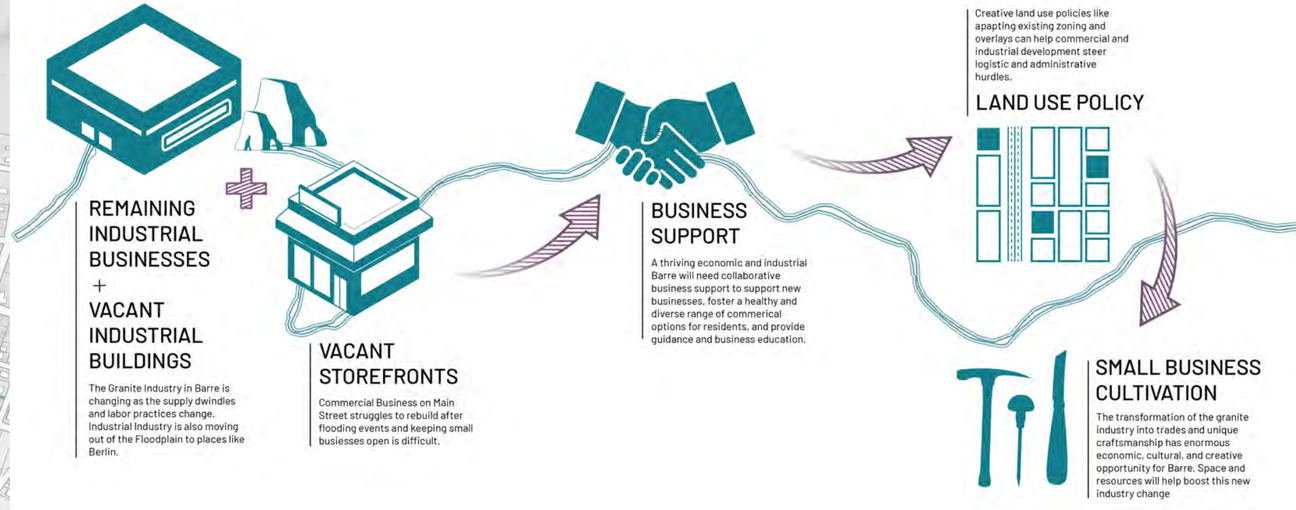
MEDIAN INCOME

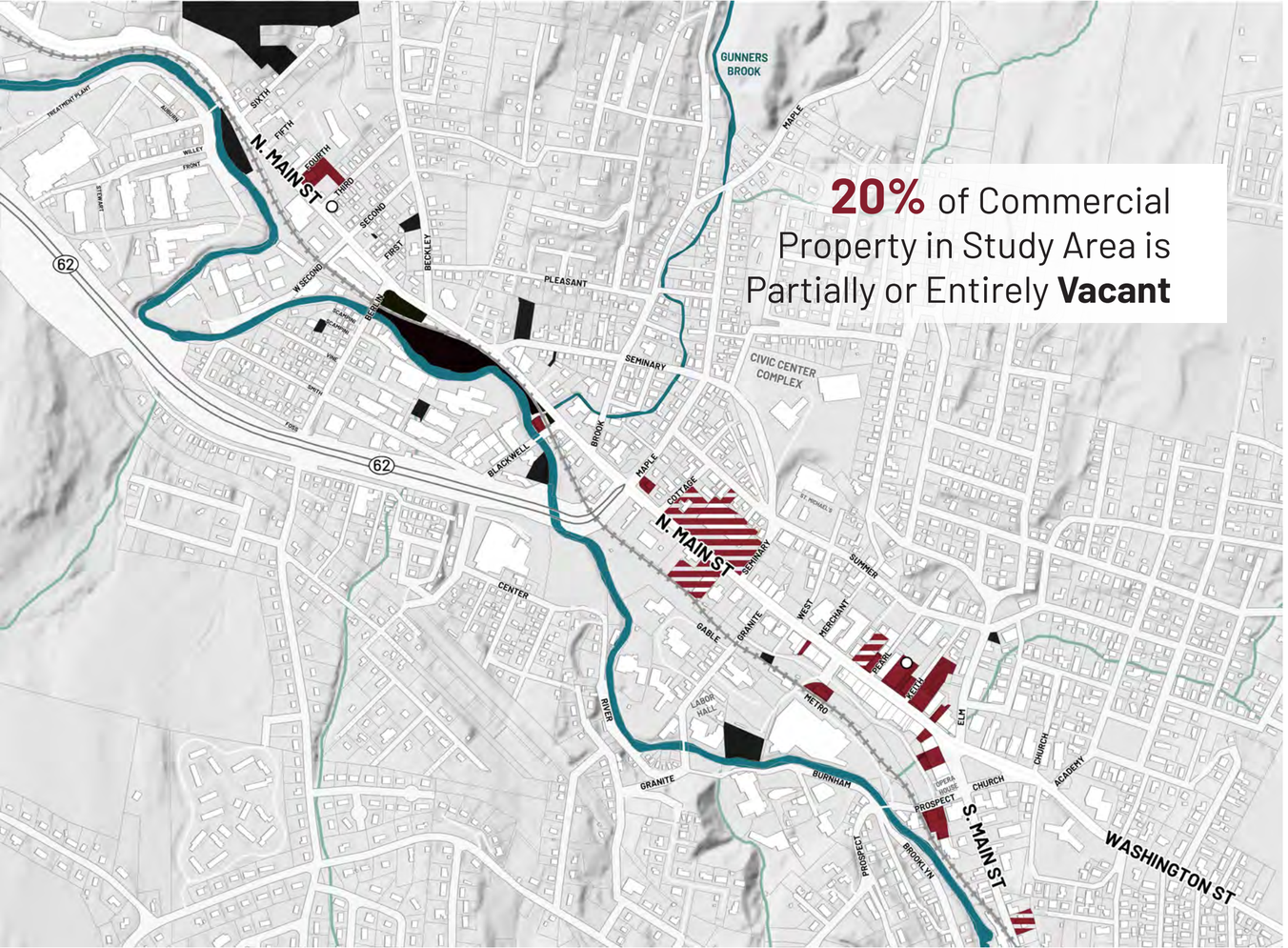




CREATING ECONOMIC OPPORTUNITY

Barre's economic revitalization strategy focuses on addressing challenges like vacant industrial buildings and storefronts, while fostering opportunities for small business growth and creative land use. By supporting existing businesses, cultivating new trades, and implementing adaptive policies, the city aims to build a resilient and thriving commercial and industrial landscape.





SMALL BUSINESS SUPPORT

Barre faces a significant challenge with high vacancy rates in its industrial and commercial properties, a reflection of the city's economic shifts and population decline. However, this vacancy also presents a unique opportunity to attract new businesses and tenants seeking affordable spaces to grow. By leveraging these underutilized properties, Barre can position itself as a competitive and cost-effective destination for startups, small businesses, and innovative ventures.

Protecting Barre's existing industrial and commercial small businesses is vital to maintaining the city's economic foundation and preserving local jobs. At the same time, attracting new businesses is essential for diversifying the economy, fostering innovation, and addressing economic challenges such as population decline and financial hardships.

Strengthening the relationship between Barre's industrial, commercial and municipal sectors can create synergies that support sustainable growth, such as collaborations between manufacturers and local retailers or service providers. This approach not only bolsters economic resilience but also ensures that Barre remains a vibrant hub for both traditional industries, like granite, and emerging businesses that can help

CITY OF BARRE
THE GRANITE CENTER OF THE WORLD
INCORPORATED 1895
WASHINGTON COUNTY VERMONT

+

Barre
AREA DEVELOPMENT INC.

+

BARRE UP

+

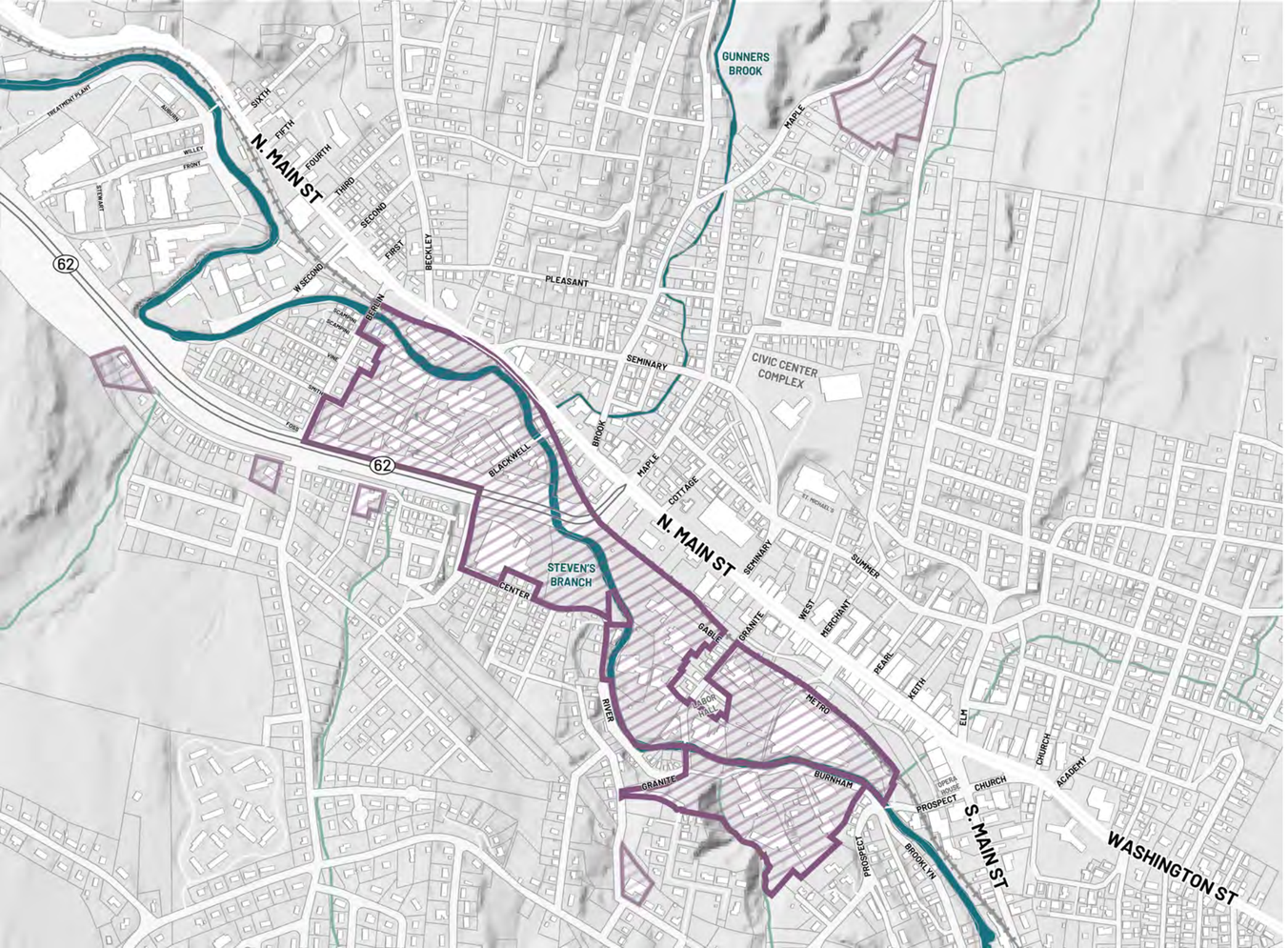
BGA BARRE GRANITE ASSOCIATION

ADAPTIVE REUSE OVERLAY DISTRICT

Barre's zoning regulations currently include an Adaptive Reuse overlay district. This overlay is intended to encourage reinvestment in vacant, obsolete or underutilized commercial or industrial properties by expanding the allowable uses on parcels in the district.

Currently, this overlay is applied to small areas with problematic land uses in primarily residential areas and is intended to promote residential development. However, this overlay can be expanded to incorporate much of Barre's industrial waterfront to allow for adaptation of underutlized industrial properties and new development that promotes economic growth in downtown Barre.

While residential development is not desirable in these industrial areas, other, more compatible uses currently permitted in the overlay district and which could contribute positively to Barre's economic growth include office, professional, business or administrative services, artist galleries and studios, indoor recreation, and fitness clubs.



Overlay

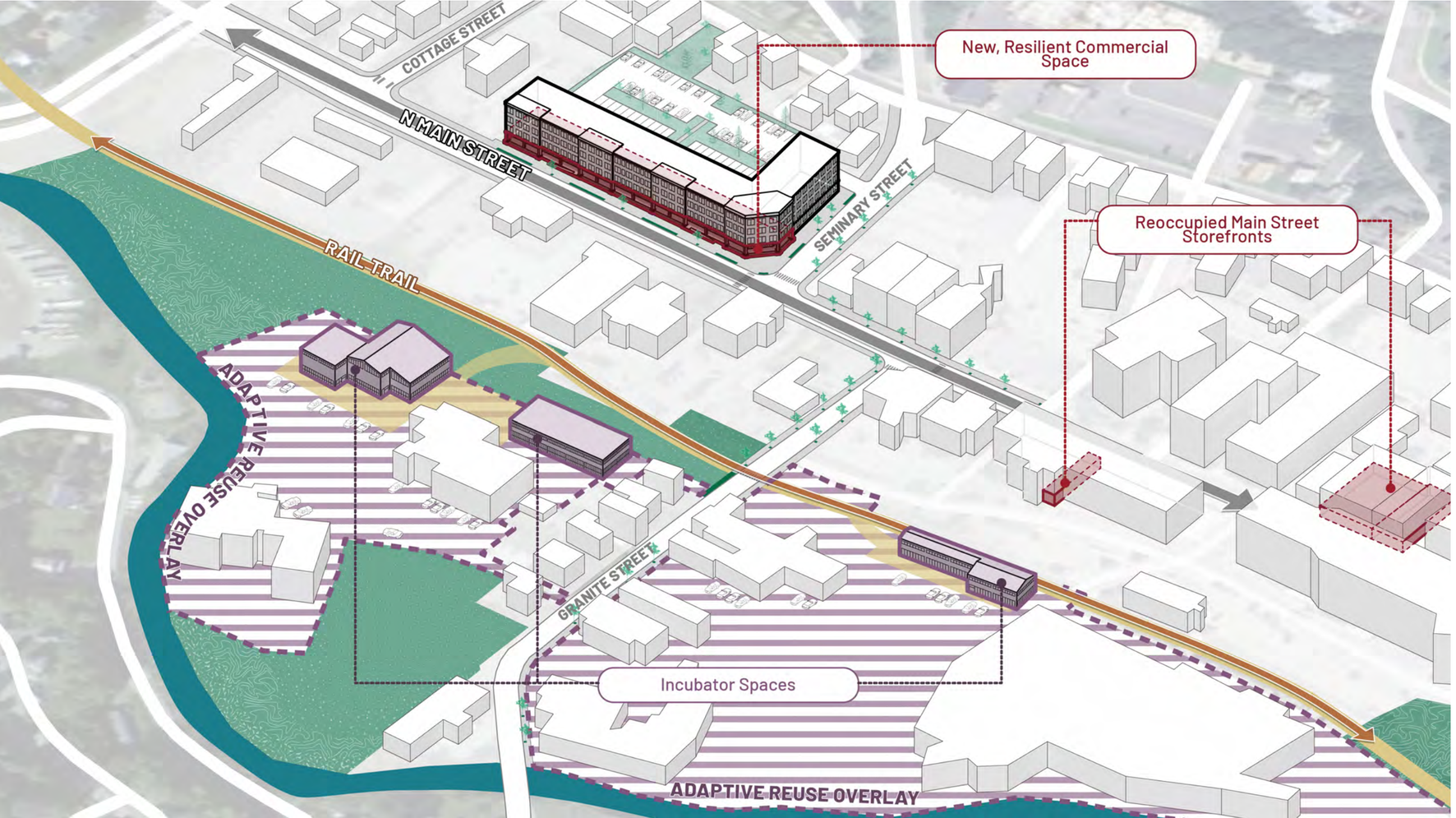
- Existing Adaptive Reuse Overlay
- New Adaptive Reuse Overlay

0 500 1,000 Feet

Case Study: Incubator Space and Commercial Integration
Artisan's Asylum, Boston, MA

The Artisan's Asylum in Boston is an example of a new use that could be accommodated within the adaptive reuse overlay, which is both complementary to existing uses in the district and supportive to growing and diversifying Barre's economy. The space offers 52,000 sqft of personal studios and shared workshops, affordable access to broad fabrication facilities, instruction and training, start-up support, classes for the community, and events for artists to sell product.

Spaces such as these could nurture Barre's artisinal community and provide new commercial opportunities for the town.



INNOVATIVE MIDDLE MAIN

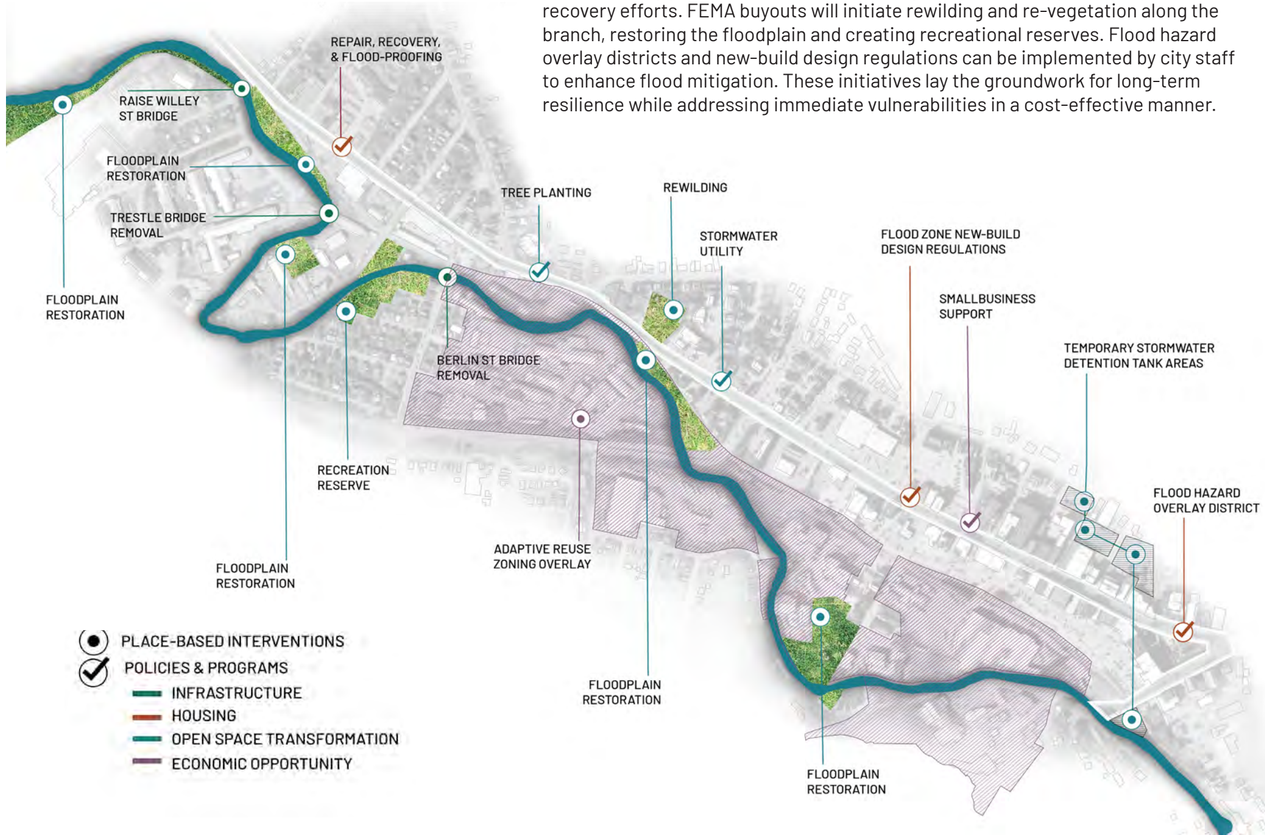
Land use reforms allowing for expanded economic opportunity along with new developments such as mixed use developments and parks and trail system that will increase activity in downtown Barre will help the city's economy adapt and grow. The adaptive reuse overlay and incubator spaces will help new industries grow along with the support of local economic development organizations. Economic growth can be supported with new commercial space in new developments and in revitalized vacant storefronts along Main Street.

MASTER PLAN

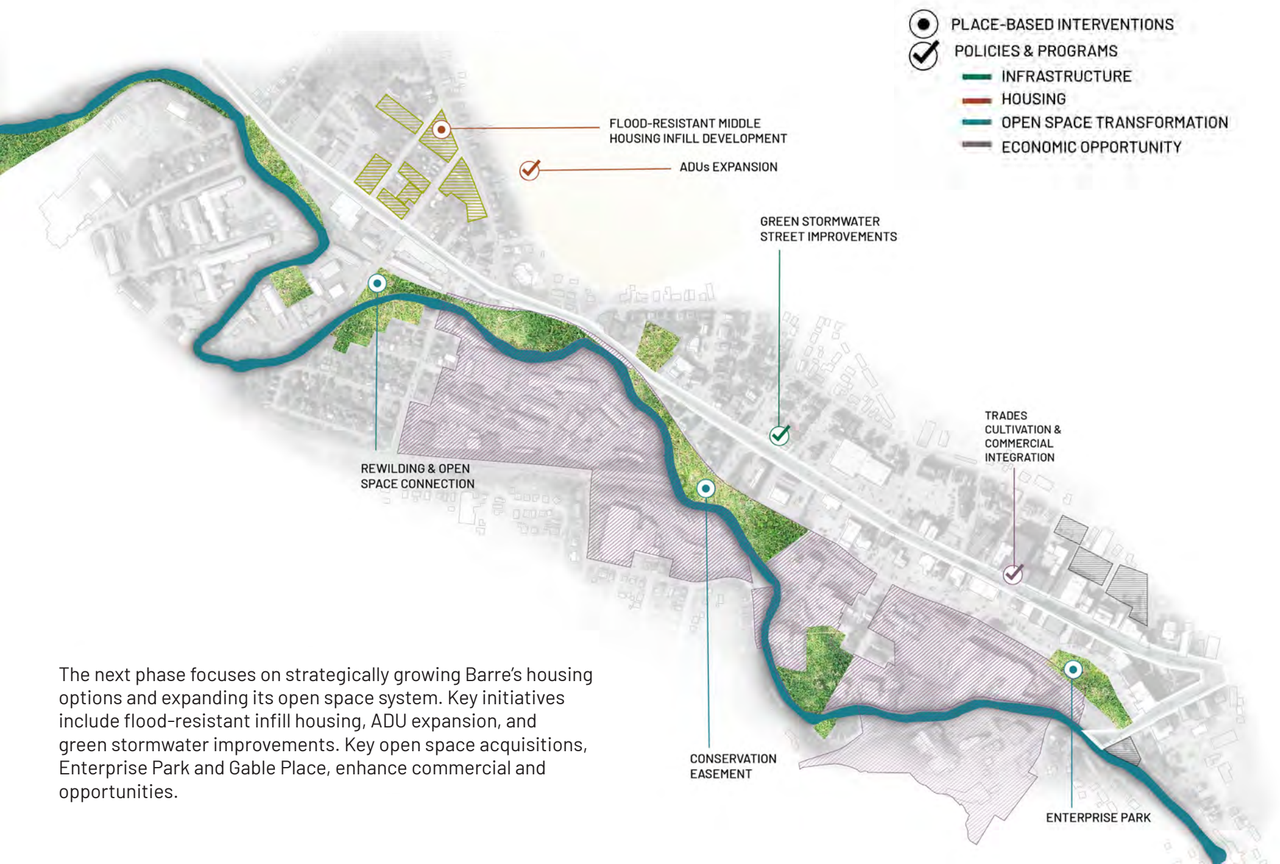
TOWARDS A STRONG BARRE

PHASE 1: PRACTICAL & ACHEIVABLE SOLUTIONS

The initial phase combines infrastructure improvements and low-cost policy measures. Key priorities include reevaluating bridges and supporting repair and recovery efforts. FEMA buyouts will initiate rewilding and re-vegetation along the branch, restoring the floodplain and creating recreational reserves. Flood hazard overlay districts and new-build design regulations can be implemented by city staff to enhance flood mitigation. These initiatives lay the groundwork for long-term resilience while addressing immediate vulnerabilities in a cost-effective manner.

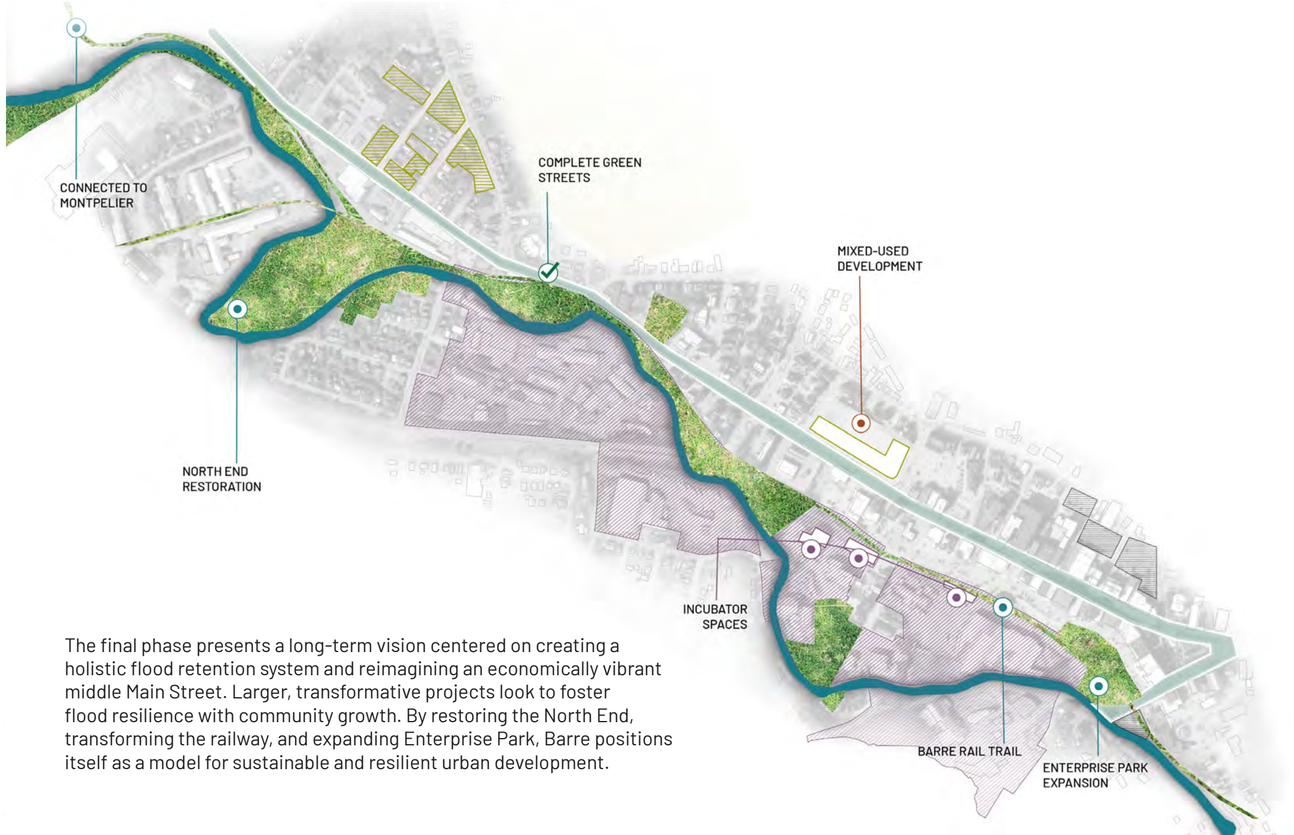


PHASE 2: STRATEGIC STEPS & DEVELOPMENT

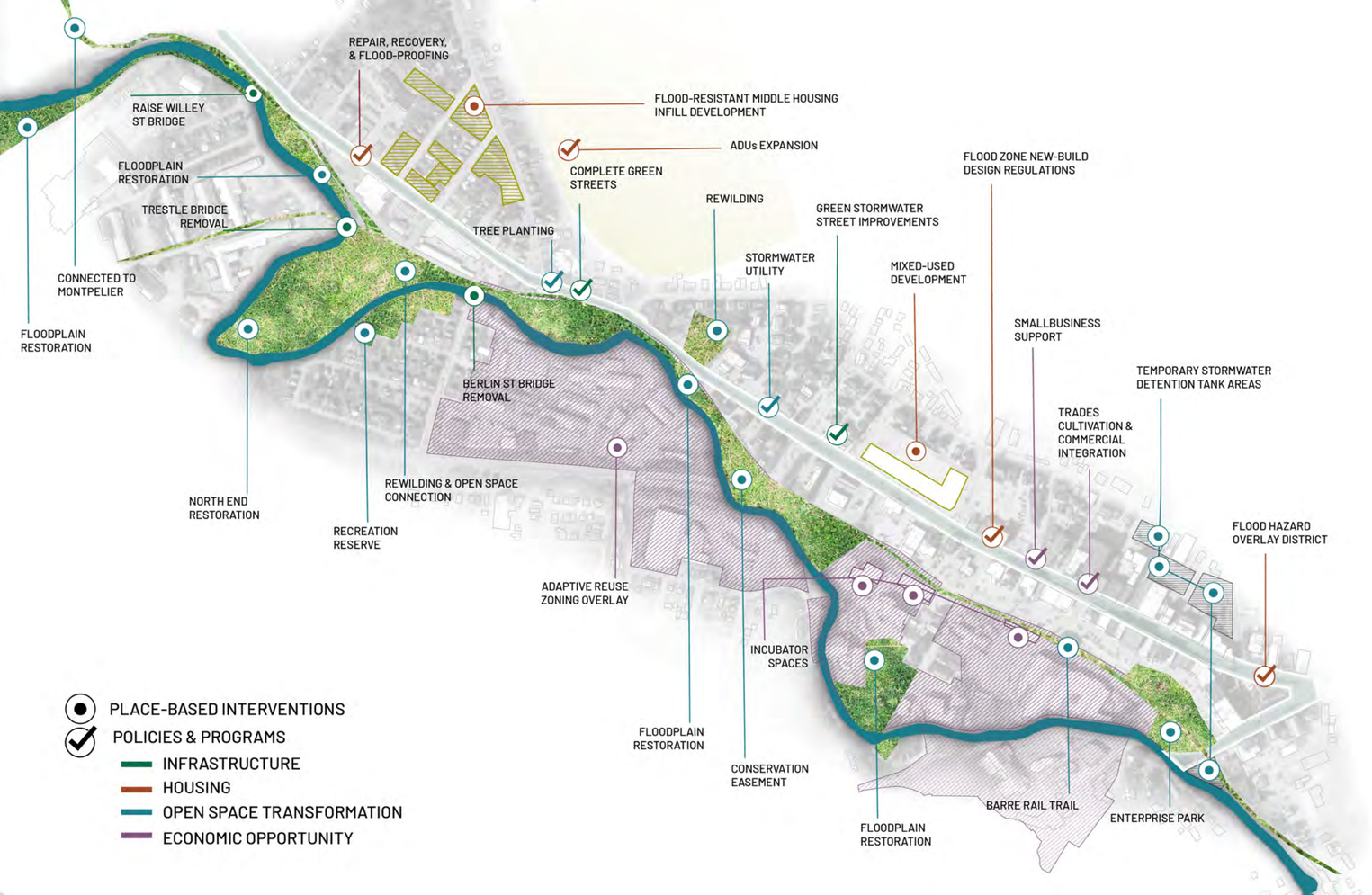


The next phase focuses on strategically growing Barre's housing options and expanding its open space system. Key initiatives include flood-resistant infill housing, ADU expansion, and green stormwater improvements. Key open space acquisitions, Enterprise Park and Gable Place, enhance commercial and opportunities.

PHASE 3: RADICAL & RESILIENT FUTURE



The final phase presents a long-term vision centered on creating a holistic flood retention system and reimagining an economically vibrant middle Main Street. Larger, transformative projects look to foster flood resilience with community growth. By restoring the North End, transforming the railway, and expanding Enterprise Park, Barre positions itself as a model for sustainable and resilient urban development.



A STRONG BARRE

MASTER PLAN

PLANNING FOR RESILIENCE IN PLAINFIELD, VERMONT

Prepared by Mark Dellostritto, Christina Moss, Yujin Song, and Lu Yii Wong
Advised by Scott Page and Jamie Granger

University of Pennsylvania, Master of City Planning - Climate Resiliency Studio
December 2024

ACKNOWLEDGMENTS

Creating this plan would never have been possible without the help of so many people in both Philadelphia and Vermont.

First off, we would like to thank our instructors, Scott and Jamie, for providing us with a fantastic studio experience, as well as everyone else at the Weitzman School of Design who aided us in this process.

We also greatly appreciate the help of various people at the state level in Vermont. Michael Gaughan, thank you for initiating this project and making so many things happen throughout the semester. Pat Moulton, your feedback, tour of the region, and overall involvement has helped greatly. To Chris Cochran, Jacob Hemmerick, and the rest of the team at Community Planning & Revitalization, thanks for meeting with us and providing additional insights at various points. And to everyone else whom we met with while we were in Vermont, who sat in on a project review, or we interacted with in some form or another, we are so grateful.

Finally, we would like to extend a special thanks to Arion Thiboumery, Karen Hatcher, and everyone else we came in contact with from Plainfield for being incredibly gracious with their time throughout this process. For helping us obtain lots of data and other resources, showing us around town during our site visit, providing tons of incredibly helpful feedback, and for just making us feel supported by the Plainfield community, we are so grateful. Plainfield is a special place, and we have thoroughly appreciated the opportunity to learn more about it and hopefully provide some ideas about how the town can adapt to its current challenges moving forward.

Weitzman SCHOOL OF DESIGN
UNIVERSITY of PENNSYLVANIA

TABLE OF CONTENTS

Grace United Methodist Church, Plainfield Village *Image Source: Planning Team*

I: PLAINFIELD: SMALL BUT MIGHTY

With a population of just over a thousand residents, Plainfield boasts a tight-knit community with an artistic and vibrant community culture.

However, the town is simultaneously facing an immediate housing crisis, complicated by its aging population.

Image Source: Plainfield Home Days

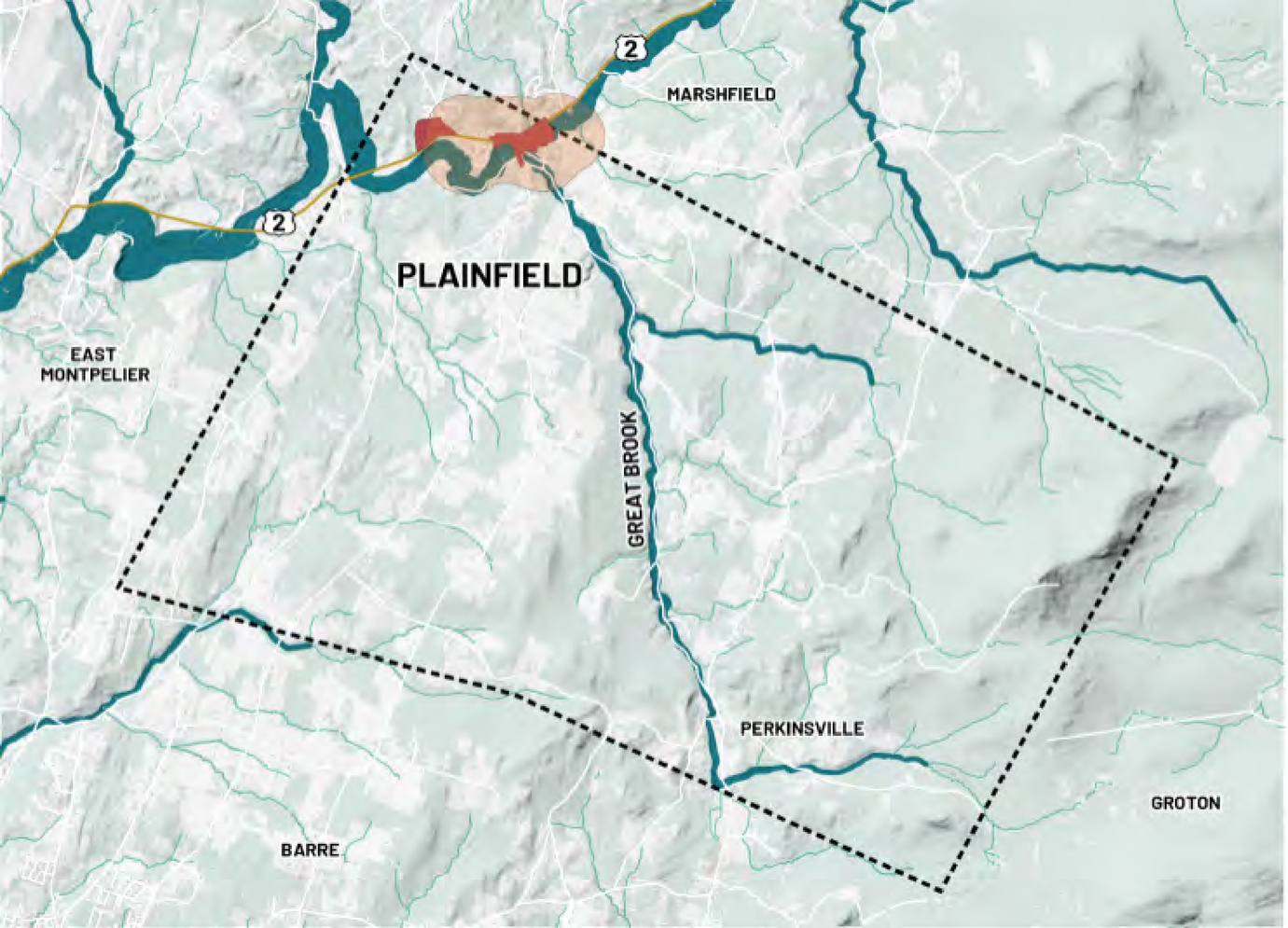
A WELCOMING, ARTISTIC COMMUNITY

In a state with hundreds of quaint, historic small towns nestled in between rolling hills and mountains covered in dense foliage, Plainfield, VT is surely one of the most quaint and special. Even though people have lived in current-day Plainfield since the early 1800s, the modern version of the town started to come about in the mid-1900s, when an alternative institution of higher education called Goddard College opened in the town's northern corner. Originally run completely by students (although that phased out over time), the school became a mecca for artists, radical leftist thinkers, and others who went against the grain. Many alumni stayed in Plainfield after they graduated, bringing the culture of the school to the rest of the town and creating a strong relationship between the two.

Plainfield residents during the town's annual Home Days Festival
Image Source: Plainfield Home Days

A local resident posing with a sculpture he created using debris left over from the 2024 flood that hit Plainfield
Image Source: Anne Wallace Allen

As a result, Plainfield has long been known as a place of acceptance, a place where anyone can move and be treated like part of the community. The arts have also become a prevalent part of Plainfield's identity, which can be seen in events like the annual Plainfield Home Days Festival, as well as important community assets like the WGDR radio station run out of Goddard's campus.



PLAINFIELD

Source: Vermont Open Geodata

- Township Boundary
- River Corridors
- Village Center Buffer
- Historic District
- Streams
- Major Roadways

0 0.75 1.5 Miles

PLAINFIELD AT A GLANCE

Compared to its small population, Plainfield occupies quite a lot of area within Central Vermont. Like the rest of the state, most of the town's 21 square miles are filled with trees, farms, and single-family homes dotted throughout the landscape, giving Plainfield a rural, small-town feel. The Great Brook, a tributary of the Winooski River, cuts the town in half as it flows from the southern border to the northeast into Plainfield Village. It is in this area, which has been dedicated as a Historic District on both the National and Vermont State registers, where these two waterways meet. Plainfielders initially settled in the village in the 1800s to harness the power of this water using mills, and it continued to grow when railroad tracks were laid down to bring in trains from nearby Montpelier. Today, Plainfield Village's historical significance comes from "the cohesiveness of the village as a whole" (Plainfield Town Plan, 2014), as the area has largely retained its 19th century charm.

Part of the village has also been officially designated as a Village Center by the Vermont Agency of Commerce and Community Development. In general, this title comes with financial incentives and other benefits for small Vermont towns looking to revitalize their central cores. However, the Plainfield village center also has a half-mile buffer around it that will be in place until January 2027. With the passage of Act 181 in 2024 – a piece of state legislation that significantly altered Act 250, Vermont's long-standing land use law that has sought to conserve untouched land by building within existing developed areas – new guidelines for development and environmental protection across the state will be implemented in a few years. In the meantime, though, residential projects proposed within this buffer area are exempted from typical Act 250 requirements, making it easier to pursue development. This will be relevant later in this plan when discussing development opportunities in Plainfield Village.

Sources: Town of Plainfield, State of Vermont

PLAINFIELD VILLAGE, THE HEART OF TOWN

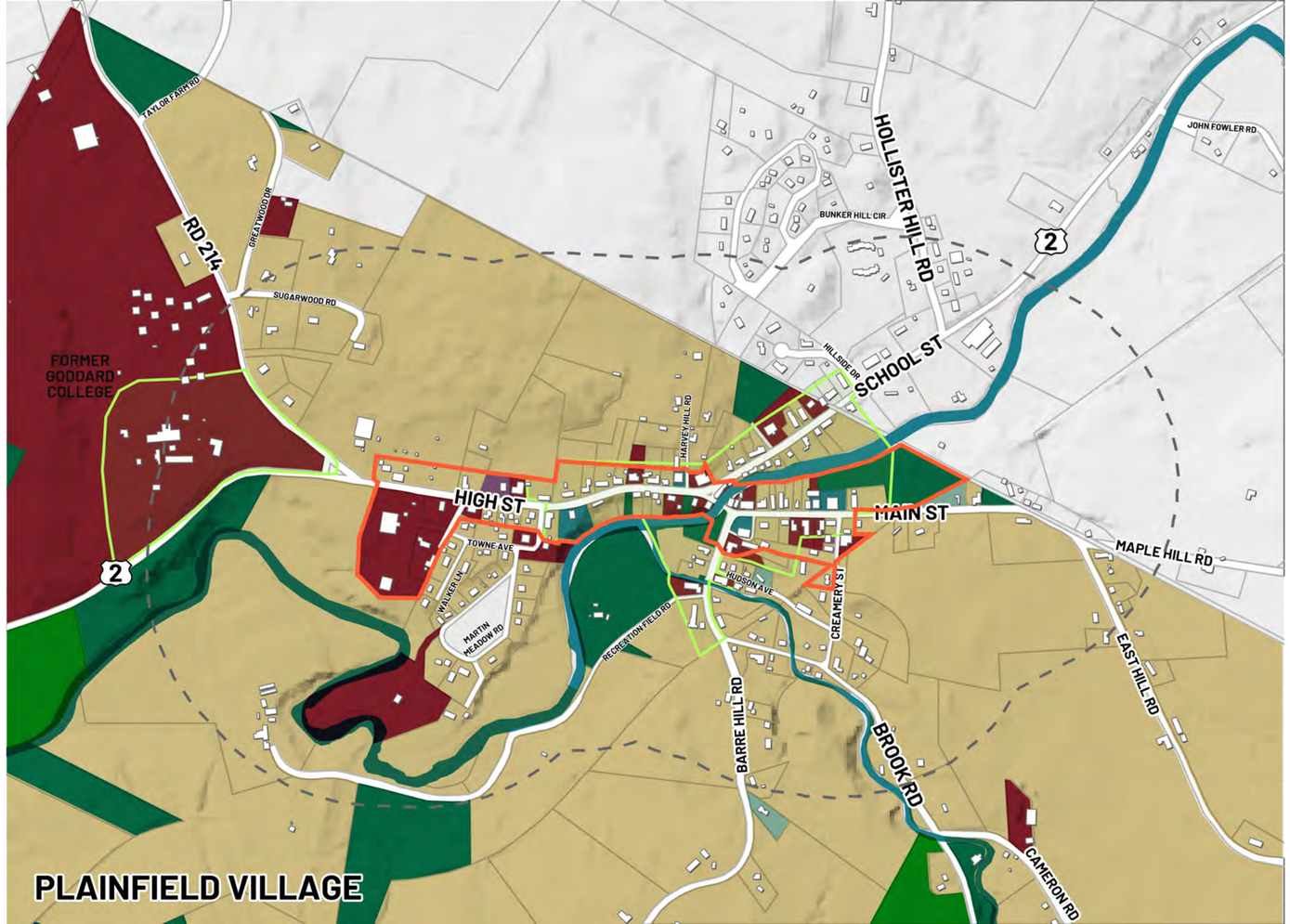
Plainfield Village is significantly more dense than the rest of town. **Almost half of Plainfield's housing units are in this area**, and they come in a wide variety of housing types, ranging from single-family homes to a thirteen-unit apartment building. Plainfield Village also contains most of the commercial businesses and institutional buildings in town, including the beloved pizza restaurant Positive Pie, Plainfield Town Hall and Opera House, the local post office, and the Cutler Memorial Library. The town recreation fields and forest trails on the nearby campus of Goddard College, an alternative college which closed following the spring 2024 semester, provide spaces for recreation. Town residents also gather at the community center on the second floor of the former Plainfield Co-op building, and utilize the ring of streets next to the rec fields for various festivals throughout the year.

Because of this greater activity, Plainfield Village also has the most vehicular traffic in town. Route 2 (also referred to locally as School St and High St) is a state road that cuts through the northern part of the village, serving as both a truck route and the main point of entry into Plainfield when coming from neighboring towns such as East Montpelier and Marshfield. Brook Rd, which closely follows the Great Brook throughout Plainfield, ends in the village where it intersects with Mill St, helping get residents and other drivers from outer Plainfield into the area.

For these reasons and many others, **Plainfield Village is the heart of the Plainfield community,** making it a major focus for this plan.

Source: Vermont Open Geodata

Plainfield Town Hall and Opera House
Image Source: Preservation Trust of Vermont



LAND USE BY PARCEL

Source: City of Plainfield

- Winooski River
- Residential
- Commercial
- Farm
- Mobile Home
- Miscellaneous (Forest Land)
- Industrial
- Institutional
- Village Center Boundary
- Village Center Buffer
- Historic District

0 500 1,000 Feet

AN AGING POPULATION

Similar to many other towns in Vermont, Plainfield has a **relatively high proportion of older residents.** Out of the 1,192 people living in the town in 2022, almost 22% were 65 years or older, contributing to the median age being 47.5 years. These two metrics were both significantly higher than the national average, illustrating the fact that overall, Plainfield's population is aging considerably.

On the one hand, **these older residents contribute greatly to the Plainfield community**. Many of them have lived in the town for decades, brought to Plainfield originally because of Goddard when it was thriving in the late 1900s, and they have helped keep the unique spirit of the town alive in the years since.

However, on the other hand, **having an older population has also brought with it a number of challenges**. Due to Vermont's system of government and Plainfield's small size, many town operations fall on the shoulders of elderly volunteers who may struggle to fulfill such duties. In the conversations our group had with Vermonters in developing this plan, we also heard that many older residents across the state are living with just their spouse or by themselves in homes that are much larger than they need, but they are not moving into smaller units because of the lack of available housing supply, amongst other reasons. This is creating issues in the state's housing market, as there is a mismatch between the housing people need and what is available, or what people are actually living in. The statistics demonstrate that this may also be the case in Plainfield: 41.7% of households in town were single-person households in 2022, and 14% were single-person households in which the resident was 65 or older.

Town Population: 1,192

Residents 65 and Older: 21.7%
16.5% nationwide

Median Age: 47.5 years
38.5 years nationwide

Finally, Plainfield runs the risk of shrinking and potentially losing its identity as a community if over time, not enough new, younger residents move in who are passionate about sustaining the town into the future. What is encouraging, though, is that according to locals, there is in fact interest from young people in moving to Plainfield for a variety of reasons. These include the town's storied history, its acceptance of people from all walks of life, and its natural beauty.

Source: American Community Survey 5-Year Estimates, 2022

PLAINFIELD'S HOUSING CRISIS

Along with its aging population, **Plainfield is also currently suffering from a severe housing crisis**. Although the decades and sometimes centuries-old homes found throughout town contribute to its historic charm, they also signify the lack of new residential units that have been built in recent times, a problem that is shared by the rest of Vermont. However, in Plainfield, it is even more pronounced; the median year of construction for housing units was 1955 in 2022, compared to 1977 for the whole state. This lack of new builds means that **residents of Plainfield and those looking to move into town have very limited housing options.** In 2022, there was a miniscule 0.3% vacancy rate for both owner-occupied and renter-occupied housing, far below the 5-8% that is normally considered to be a "healthy" rate for a housing market.

Limited supply means greater demand for the units that are available, driving up costs. 62% of renter households (which made up about 30% of households in town) and 56.5% of owner households (which made up the remaining 70%) were cost burdened in Plainfield in 2022, meaning that 30% or more of household income was going towards housing costs. While these percentages are incredibly high in general, they are also higher than the values for Washington County, where 46.2% of renter households and 44.5% of owner households were cost-burdened. Overall, a lack of new construction has made it so that Plainfielders are having to pay too much for older housing, a problem that is only getting worse due to severe flooding events, which will be addressed next.

Median Year of Construction: 1955
Vermont: 1977

Owner-occupied and Rental Housing Vacancy Rate: 0.3%
5-8% is a "healthy" rate

Percentage of Renters Who are Cost-Burdened: 62%
Washington County: 46.2%

Source: American Community Survey 5-Year Estimates, 2022

III: IMPACTS OF FLOODING

Impacts from the flooding that Plainfield experienced in 2024 will continue to be felt for years to come, and a large portion of the town's built environment is still under threat from future flood events.

THE FLOODING OF 2024

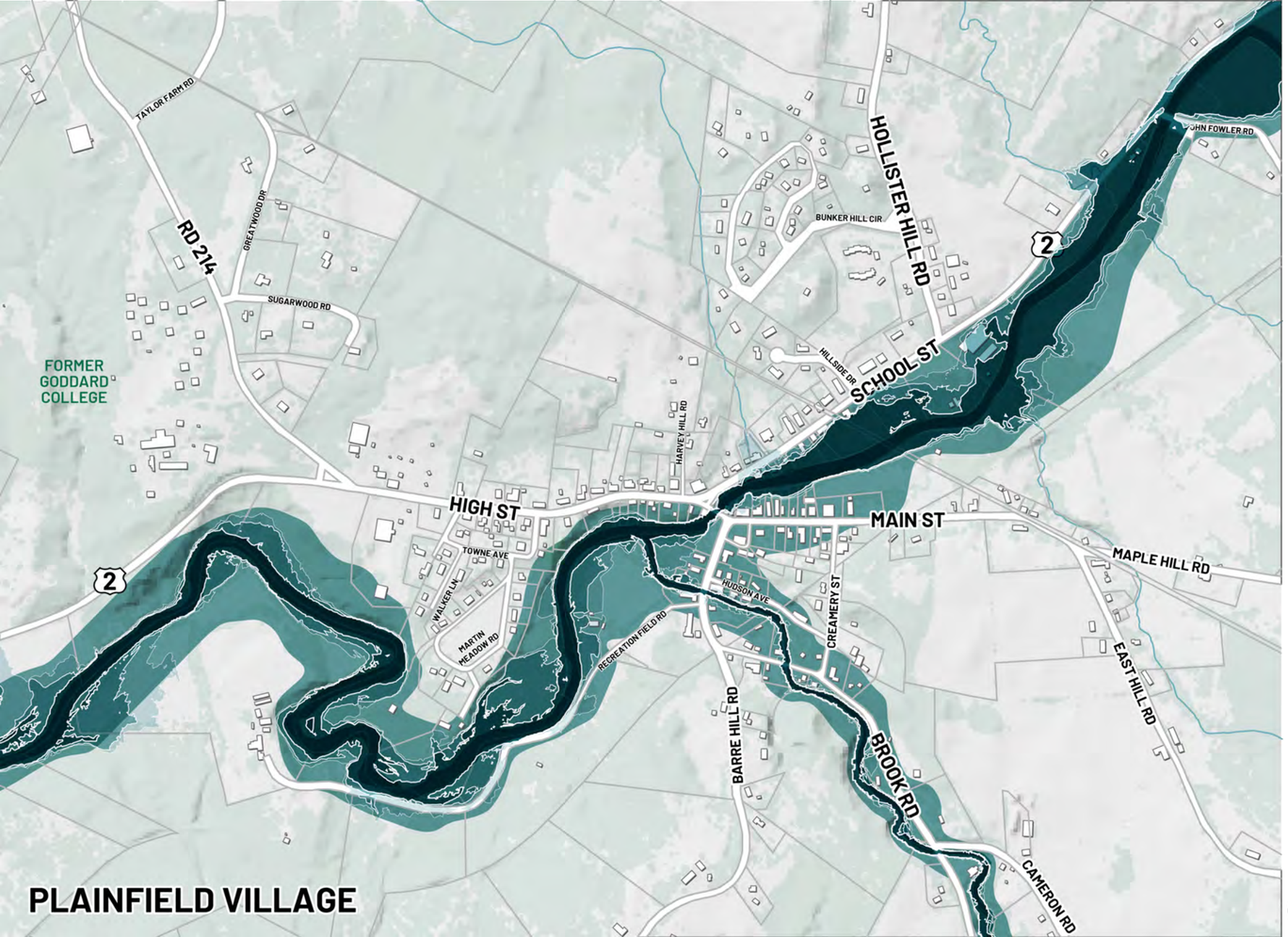
On July 10 and 11, 2024, Plainfield and the rest of Vermont suffered from heavy rains brought on by Hurricane Beryl, which impacted large portions of the Caribbean, the southern and eastern U.S., and parts of eastern Canada. At 7 and 7:06 am, the National Weather Service recorded rainfall totals of 4.57 and 3.89 inches in Plainfield. This caused the waters of the Great Brook and the Winooski River to rise over their banks, with even more water plummeting down at high speeds into Plainfield and especially Plainfield Village from higher elevations in neighboring, upstream towns to the west. Although some parts of Vermont saw upwards of seven inches, **Plainfield still suffered considerable damage** that was covered in various news outlets throughout the state and across the nation. Homes, roads, and bridges were washed away, including a bridge along Mill St in the heart of Plainfield Village; remaining streets and yards were covered in silt and mud; and residents were left shaken up.

The biggest loss was the destruction of the "Heartbreak Hotel," a beloved eight-unit apartment building that housed residents at the corner of Mill St and Recreation Field Rd, along the Great Brook, for over 100 years after it was built in 1912. Originally a home for struggling workers employed at local mills, it soon became open to all Plainfield residents, but rents stayed low compared to apartments in the rest of town. This tradition endured for decades until about two thirds of the building was washed away into the Great Brook due to the flooding, rendering the rest of it uninhabitable and leading the owner to accept a buyout offered by the town and FEMA. Many town residents lived in the building at one point or another; in the words of one local resident, Jake McBride, it was "like a gateway to Plainfield," a place where people could live for a few months, a year, or a decade before moving on to another home in town. Each one of the properties lost or damaged by the floods had an impact on Plainfield, but **the Heartbreak Hotel was a particularly meaningful building that will be hard to replace.**

What is remaining of the Heartbreak Hotel
Image Source: Vermont Public Radio

A property rendered uninhabitable by the flooding
Image Source: Planning Team

Sources: Vermont Public Radio, VT Digger



FLOOD HAZARD AREA

Source: Vermont Open Geodata

- Winooski River
- River Corridor
- Streams
- Wooded Area

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

0 500 1,000 Feet

CONTINUED FLOOD RISK IN PLAINFIELD

As in so many other towns throughout Vermont, **recent events have highlighted Plainfield's susceptibility to this flooding, which is only becoming more frequent and more dangerous over time due to climate change.** The Winooski and the Great Brook were historically seen as opportunities for Plainfielders, sources of energy that could help produce goods and enable one to make a living. Now, combined with intense rainfall, these waterways pose a threat to the homes and other properties that residents built with those livings.

According to a Flood Inundation Model created by the University of Vermont's Spatial Analytics Lab:

28% of Plainfield's property value, or $43.6 million (using Vermont Grand List data), **is within a flood hazard area and at risk of being inundated during a 500-year flood event.**

15%, or $23.8 million, is at risk in just a two-year flood event, meaning over one seventh of Plainfield's property value is vulnerable to flooding that is expected every two years.

0.25%, or $0.39 million, is within the 5-25 year hazard area, and

$19.4 million or 12% is within the 50-500 year hazard area.

Looking specifically at housing, **105 of Plainfield's 538 units – 19.5% – are at risk from flooding.**

While these numbers would be a cause for concern in and of themselves, the town's acute housing shortage in general makes them even more threatening. Flooding events like July 2024 that destroy homes and render them uninhabitable only reduce the very limited supply of units that Plainfielders and others coming to town can currently move into.

Sources: University of Vermont, Vermont Grand List

DAMAGES AND A CHANGE IN DIRECTION

Although the waters of the Winooski and the Great Brook have subsided from their peak on July 10, the path of these waterways was significantly changed by the floods. As both of them filled up with 3-4 inches of rain in just a matter of hours, the water began to flow faster. This was especially true within the Great Brook, which flows down from Plainfield's more elevated areas in the south into the low-lying village. In both the Winooski and the Great Brook, **the speed of this water dislodged large sections of natural material along their banks, causing significant erosion**. This widened the path of these waterways going forward and brought them closer to filling their natural corridors, as shown on the map to the right. These corridors show the full potential width of these waterways if they were able to meander naturally through the landscape, absent any human interventions or development.

The "Flood Damage" layer on the map was drawn based on drone imagery taken by UVM immediately after the floods. It attempts to show the new path of the Winooski and the Great Brook created by this erosion. Arguably the most significant change occurred along the Great Brook as it neared and then entered Plainfield Village, where flood waters would have theoretically been traveling the fastest, and the brook is a bit more channelized due to the area being more densely developed. This resulted in major damages and a concentration of properties eligible for a FEMA buyout.

Sources: University of Vermont, VT Digger

Image Source: Planning Team

2024 FLOOD IMAGERY

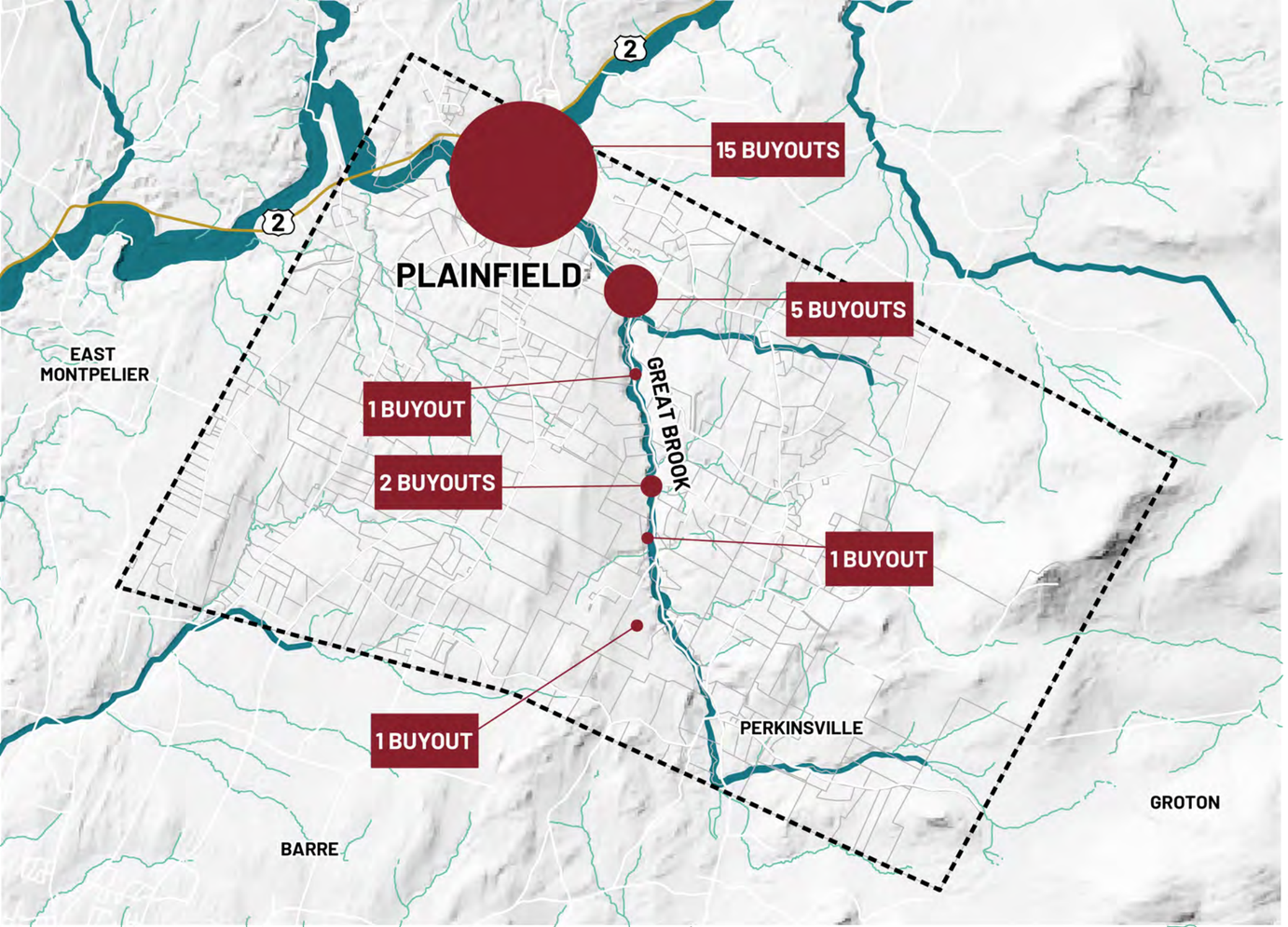
Source: Vermont Open Geodata

- Winooski River
- River Corridor
- Streams
- Flood Damage (2024)

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

0 500 1,000 Feet



WHOLE TOWN BUYOUTS

Source: City of Plainfield, Vermont Open Geodata

- Township Boundary
- River Corridors
- Streams
- Major Roadways

0 0.75 1.5 Miles

FEMA BUYOUTS IN PLAINFIELD

Across all of Plainfield, property owners have voluntarily decided to enter into the **FEMA buyout process for 25 properties** due to the damages sustained during the flood. These properties contain **35 housing units and are valued at $3,972,400 according to the Vermont Grand List.** Through this process, these properties will be purchased ("bought out") and owned by the town. The majority of funding will come from the Federal Emergency Management Agency (FEMA), while the state and Plainfield will contribute the rest. Once acquired, these lands cannot be redeveloped for housing or commercial use due to flood risks. However, they can be repurposed for recreational fields, community gardens, wetland restoration, or flood mitigation projects, because of the demonstrated risk to the land and anything on it from environmental hazards. Despite these restrictions, there is still a bit of variability in what can be done with the land, like recreational fields, a community garden or farm, or for wetland restoration.

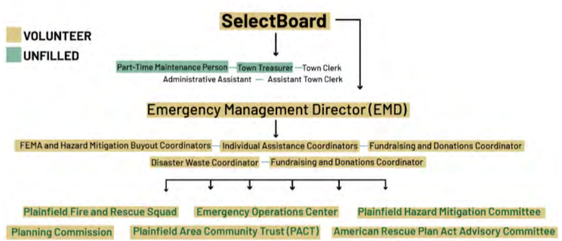
The **majority of buyouts in Plainfield – 15 out of 25 – will be conducted directly within or right near the village center**. The remaining ten will be for properties located south of the Village, all of which are located along the Great Brook. Five out of these ten buyouts are clustered near the confluence of the Great Brook and a smaller stream that feeds into it, a bit north of the intersection between Brook Rd and Fowler Rd, while the other five are scattered at different points along the brook. The size of these buyout properties also varies considerably, although they are generally larger outside of the village. The smallest property, which is located within Plainfield Village, is 0.1 acres, while the largest is the southernmost buyout in town, totaling 68 acres.

In total, **these buyouts will add 110.17 acres of publicly-owned green space to Plainfield**, providing opportunities to build new recreational and community spaces, and also pursue flood mitigation interventions that will make the town more resilient against future flooding. However, the loss of 35 housing units simultaneously **places an even greater strain on Plainfield's serious housing shortage**, displacing residents who have extremely limited options elsewhere in town as far as available housing. Additionally, losing properties worth almost $4 mlion in property value will **diminish the town's already limited financial resources**, making it more difficult to pay for not only projects associated with flood recovery, but also all of the other expenses that Plainfield has as a functioning town.

Sources: Town of Plainfield, Vermont Grand List, Vermont Parcel Viewer

LIMITED FINANCIAL AND ADMINISTRATIVE CAPACITY

As Plainfield continues with its long-term flood recovery, arguably the biggest challenge that the town will face is its lack of financial and administrative capacity. In the words of a state employee whom we talked with during our site visit, Vermont towns still operate in the same way that they did when George Washington was president. In a small town like Plainfield, this means that **the government is run almost entirely by resident volunteers**, as reflected in the chart at the right, which shows the town's emergency response network that has been involved in recovery efforts. In general, but especially in situations like what the town is currently facing, these roles can be quite time-consuming and difficult for those who volunteer, who may have never done this type of work in the past. It can also be a struggle to get a sufficient number of volunteers for the amount of work that needs to be done, placing an outsized burden on those who participate. To further complicate matters, there is also no county government in Vermont, meaning that towns are forced to lean on the state and their local regional planning commissions – Plainfield is under the purview of the the Central Vermont Regional Planning Commission (CVRPC) – for additional people power in getting things done.



Town of Plainfield Emergency Response Chain of Command
Graphic Source: Created by Planning Team

Plainfield residents during a town meeting
Image Source: Town of Plainfield

A major reason why Plainfield only has a few paid staff people as a town is because it also has a **very small amount of money at its disposal**. The town's yearly budget is largely dependent on property taxes, but with so few residents, those taxes were only able to **support a budget of around $1.4 million for FY 2024**. These limited resources make it difficult to pursue major projects, like tackling the damages brought on by the 2024 flooding. For example, the town has estimated that to repair all of the damaged portions of Brook Rd, the total cost would be somewhere $10 and 15 million. While the majority of funding for these repairs will hopefully come from federal and state sources, any contribution from the town of Plainfield will place a significant burden on the town's finances, considering that other regular expenses needed to continue running the town as normal will still need to be addressed.

Source: Town of Plainfield

COMMUNITY STRENGTH IN THE FACE OF ADVERSITY

Sign of appreciation and continued need for volunteers in Plainfield
Image Source: Plainfield People Facebook Group

Residents have also continued fighting the good fight in the months since. The town has already applied for a FEMA Hazard Mitigation grant to pay for repairs to Brook Rd; the aforementioned buyouts have already been approved; and discussions are being had on how to build new housing for those who are now without a home. This work will go on for a number of years, and some volunteers are understandably feeling the strain that comes with it. However, if recent events are any indication, Plainfielders will not give on their community, providing a sense of hope amidst the struggle.

While flooding has shone a light on many of Plainfield's flaws, it has also served as a reminder of the town's strength and inspiring sense of community. For example, in the immediate aftermath, residents helped their neighbors shovel mud out of their basements and clean debris from their yards. Others provided free meals, moral and emotional support, or a place to stay for those who were displaced from destroyed homes. The need was great, but Plainfielders stepped up for their community when it was needed most.

Flood recovery efforts in Plainfield
Image Source: Plainfield People Facebook Group

III: KEY ISSUES, VISION, AND PLAN THEMES

ISSUES

Taking all of this into account, one can see that Plainfield is facing **three primary issues** in the present day.

1. **An increasing threat of flooding:** As in the rest of Vermont, flooding is unfortunately not going away in Plainfield. Warmer weather brought on by climate change and the heavier, more sporadic rain storms that come with it will continue to plague the town, and will likely happen more frequently as time goes on.

2. **A severe housing crisis, exacerbated by flooding:** Simply put, Plainfield does not have enough housing, as reflected in its incredibly low vacancy rate. Besides inhibiting mobility for both existing residents and those hoping to move into town, this has made housing more expensive for locals, leading to high rates of cost-burdenedness. And, on top of these preexisting issues, the 2024 flood rendered over 100 acres of land in town undevelopable while taking away 35 housing units, only making the situation worse.

3. **Limited capacity:** Plainfield is a small community that is run largely by volunteers on a very small budget. Despite the incredible efforts of said volunteers, these constaints can make it difficult for the town to operate normally and take on any kind of major project. This will complicate Plainfield's recovery from the 2024 flood in a way that neighboring towns like Montpelier and Barre have to worry about less, considering the greater amount of resources and full-time staff they have at their disposal.

VISION

Through the lens of resilience, Plainfield will promote development outside of the floodplain, enhance connections through village trails, and maximize newly available open space. Inspired by the challenges of recent floods, Plainfield with embrace a paradigm shift in how the town approaches planning and development.

Image Source: Planning Team

THEMES

In spite of these issues, Plainfield has the potential to thrive in the future while retaining its unique culture. Various recommendations are provided in the following chapters that seek to harness that potential, and there are four specific themes that run through them: resiliency, capacity, expansion, and unity.

1. **Resiliency:** Considering the demonstrated threat that flooding poses for Plainfield, improved flood and climate resiliency will of course be crucial for the town going forward, which is one reason why resiliency is the overarching theme of this plan's recommendations. However, each proposed project also strives to make Plainfield more metaphorically resilient as a community, going past just physical resiliency.

2. **Capacity:** With that being said, each recommendation also tries to take into account Plainfield's limited capacity, acknowledging what can be done during implementation to ease the burden on town residents and the town's budget.

3. **Expansion:** This theme relates primarily to two proposed development projects on the former Goddard College campus and a parcel currently referred to as the Village Expansion Area. With so few residents to begin with, a housing crisis made worse by 25 FEMA buyouts, and a desire felt by many locals to bring new people into town, Plainfield must expand, albeit in ways that do not put the town at greater risk of flood damage.

4. **Unity:** If these development projects are pursued, Plainfield Village will become much more spread out and physically disjointed, potentially damaging residents' strong social connections. Efforts should be made to connect these different segments of the village together into a cohesive whole, fostering connections instead of weakening them.

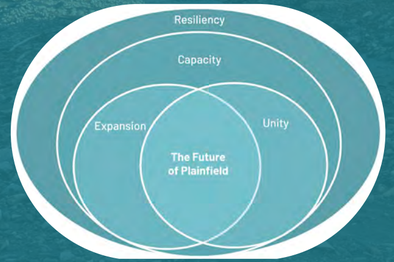


Image Source: Planning Team

IV: DEVELOPMENT OPPORTUNITIES
IV.1: GODDARD COLLEGE

Goddard College will become a vibrant and inclusive hub that celebrates its historical heritage on the scenic campus.

Building on its legacy as an eccentric, creative haven for artists and a pioneer of alternative education, the college will foster new housing opportunities and create dynamic public and commercial spaces that inspire creativity, support community connection, and encourage sustainable growth.

INTRODUCING GODDARD COLLEGE

Nestled on 114 scenic acres in Plainfield, Vermont, Goddard College has long been a symbol of creativity, innovation, and alternative education. However, in April of this year, the college announced its closure due to declining enrollment and financial challenges, marking the end of an era for this beloved institution. In October, the site found new ownership under Execusuite LLC, a real estate development firm dedicated to reimagining the property. As Mike Davidson of Execusuite stated, the firm is eager to "work with stakeholders to ensure the best possible outcome for the community."

This chapter explores the extraordinary opportunity presented by the redevelopment of Goddard College. With its vast acreage outside the floodplain, proximity to Plainfield's Village Center, and unique on-site amenities, the property is poised to play a transformative role in addressing the town's most pressing needs. The purpose of this chapter is to outline strategic redevelopment initiatives that not only maximize the site's potential but also deliver lasting benefits for the community.

Through a thoughtful blend of housing solutions, cultural preservation, and innovative community spaces, this plan reimagines Goddard College as a cornerstone of resilience and growth, inspiring future generations and enriching the lives of Plainfield's residents.

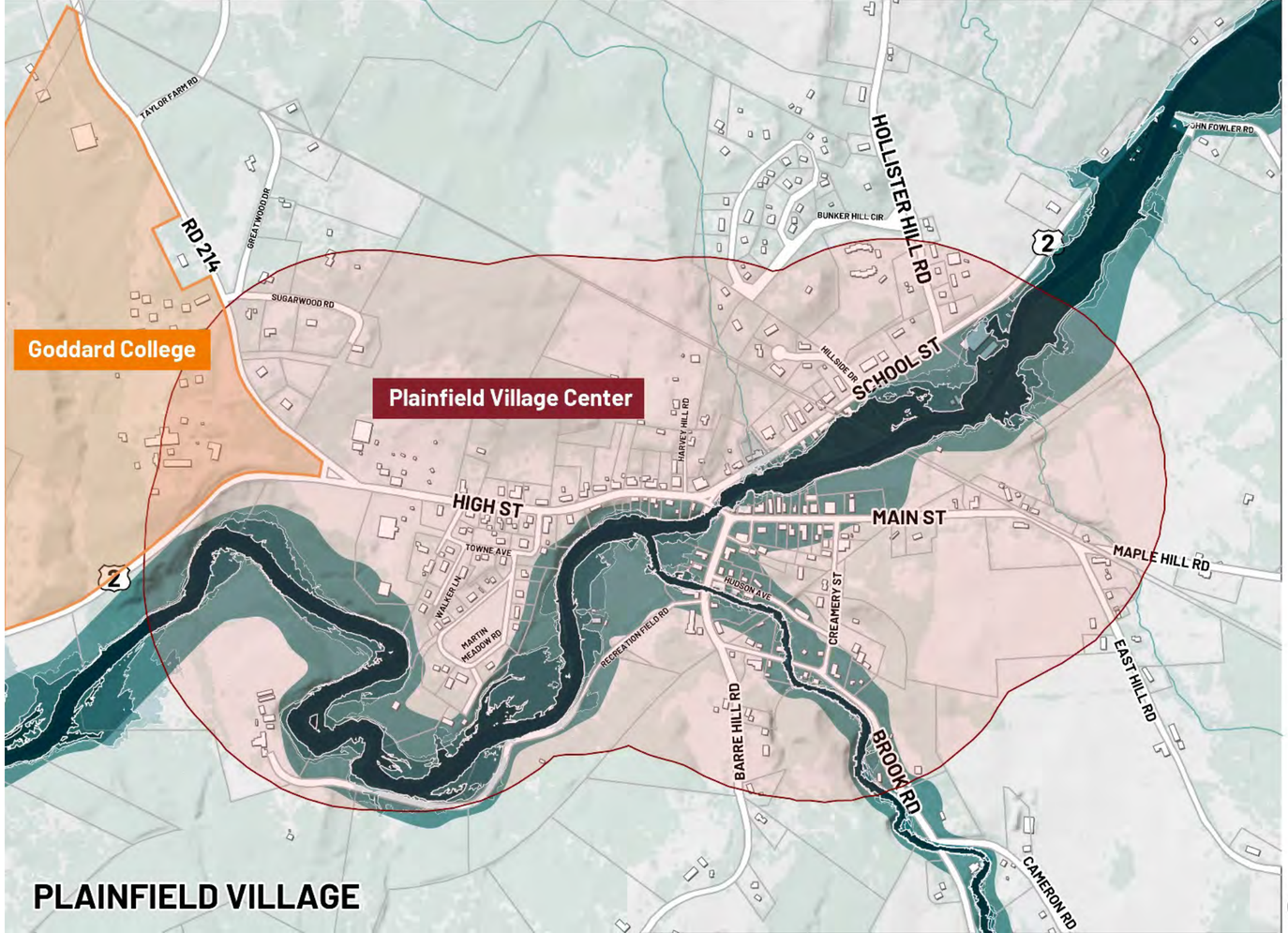
Source: Glenn Russell/VTDigger

SITE OVERVIEW

HISTORICAL AND GEOGRAPHIC CONTEXT

Goddard College occupies a unique and strategically significant location within Plainfield, Vermont. Nestled within the Village Center Buffer, the site is positioned in a designated commercial and residential district that incentivizes thoughtful development. This advantageous location lies outside of the floodplain, making it a rare and resilient parcel of land in a region increasingly impacted by climate-related challenges. These factors establish Goddard College as an ideal site for redevelopment that can bolster Plainfield's future while respecting its past.

Martin Manor on Goddard College Campus
Image Source: Vermont Daily Chronical



GODDARD COLLEGE

Source: Vermont Open Geodata

- Winooski River
- River Corridor
- Streams
- Wooded Area

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood
- Village Center Buffer
- Goddard College

0 500 1,000 Feet

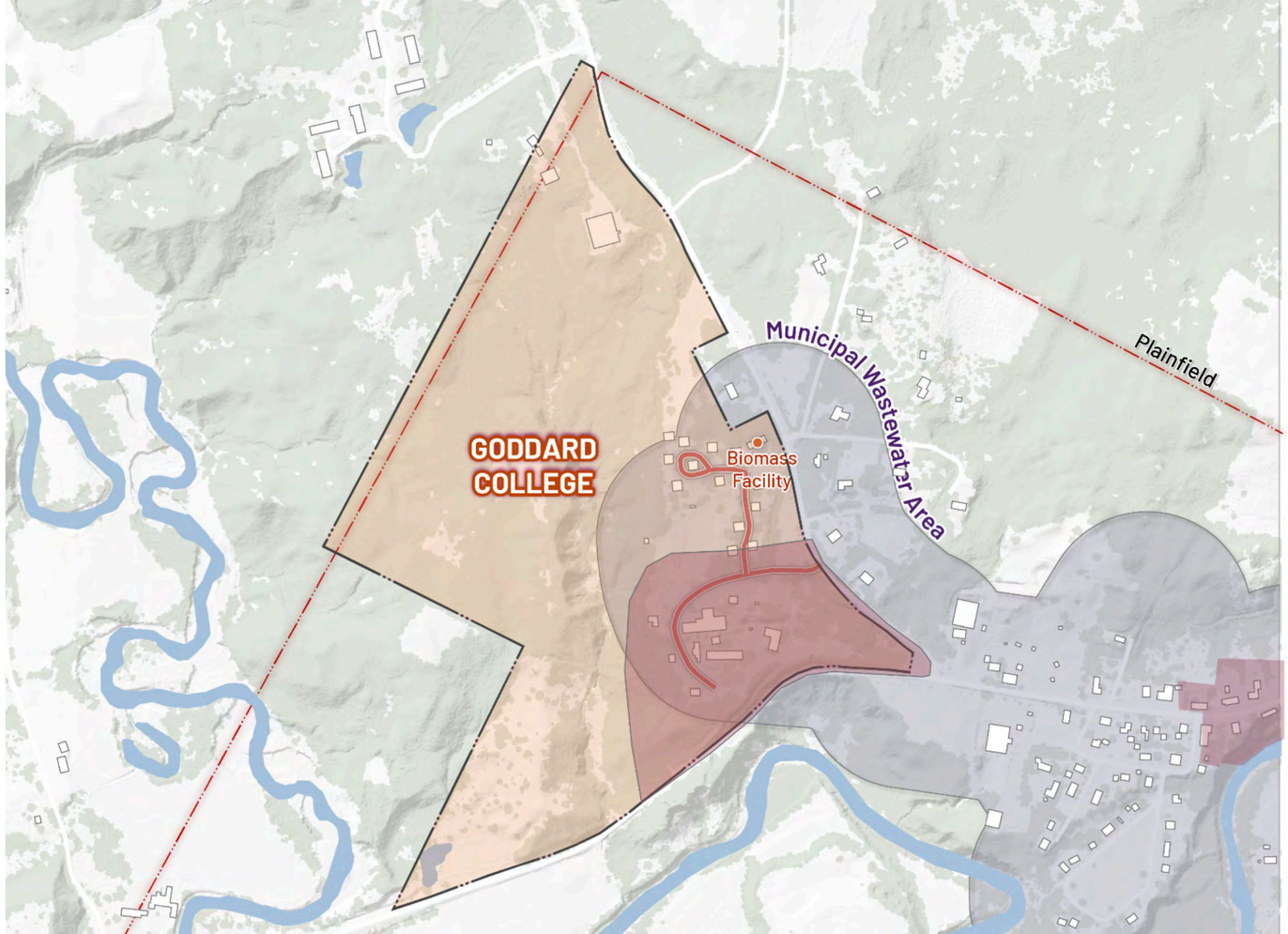
A SITE PRIMED FOR GROWTH

Goddard College's infrastructure further strengthens its potential as a development hub. Unlike much of rural Vermont, the property is connected to a municipal wastewater system, enabling higher-density development that is more sustainable and efficient than parcels reliant on septic systems. This feature supports the creation of much-needed housing and other facilities without overburdening local infrastructure. Adding to its appeal, the site boasts an on-site biomass facility, a forward-thinking energy solution that provides sustainable heating to its buildings. This resource aligns with Vermont's commitment to environmental stewardship and can serve as a model for integrating renewable energy solutions into community development.

A CRITICAL OPPORTUNITY FOR PLAINFIELD

Plainfield, like much of Vermont, faces a severe housing shortage, worsened by recent floods. This crisis highlights the urgent need for diverse housing options, from transitional housing for displaced residents to senior living for the town's aging population. The redevelopment of Goddard College, with its strategic location and unique assets, offers an opportunity to address these needs, support local businesses, and revitalize the economy. By focusing on resilience, sustainability, and inclusivity, this project can transform Goddard College into a cornerstone of Plainfield's growth, blending innovation, community-centered design, and sustainable development for a brighter future.

Biomass Facility on Goddard College Campus



UTILITY AND FACILITY

Source: Vermont Open Geodata

- Goddard College
- River
- Municipal Wasterwater Area
- State Historic District
- Transmission Line & Cable Route
- Biomass Facility

0 0.05 0.1 0.2 Miles

REDEVELOPMENT VISION

OVERVIEW OF PROPOSED SITE DIVISIONS:

The redevelopment of Goddard College has been conceptualized into four distinct opportunity zones, each designed to maximize the site's potential while addressing the pressing needs of Plainfield's community. The site is divided into the Creative Zone, Residential Zone, Mixed-Use Zone, and Trails and Recreation Zone.

CREATIVE ZONE

The redevelopment of Goddard College has been conceptualized into four distinct opportunity zones, each designed to maximize the site's potential while addressing the pressing needs of Plainfield's community. The site is divided into the Creative Zone, Residential Zone, Mixed-Use Zone, and Trails and Recreation Zone.

RESIDENTIAL ZONE

The Residential Zone encompasses 11 dormitory buildings, the design center, the biomass facility, and a greenhouse. Many structures in this zone will be converted into housing. This area will provide urgently needed multi-family housing, addressing Plainfield's housing shortage. Future phases include plans to develop high-density residential units on underutilized plots like the parking lot.

MIXED-USE ZONE

The Mixed-Use Zone is located on the northern tip of the site. This zone has a few structures featuring the Eliott D. Pratt Center Library and some student-built buildings. The library currently houses the WGDR/WGDH radio station that broadcasts alternative media to the area. The Mixed-Use Zone will maintain these community functions while exploring long-term opportunities for mixed-use residential and commercial development on 3.8 acres of undeveloped land.

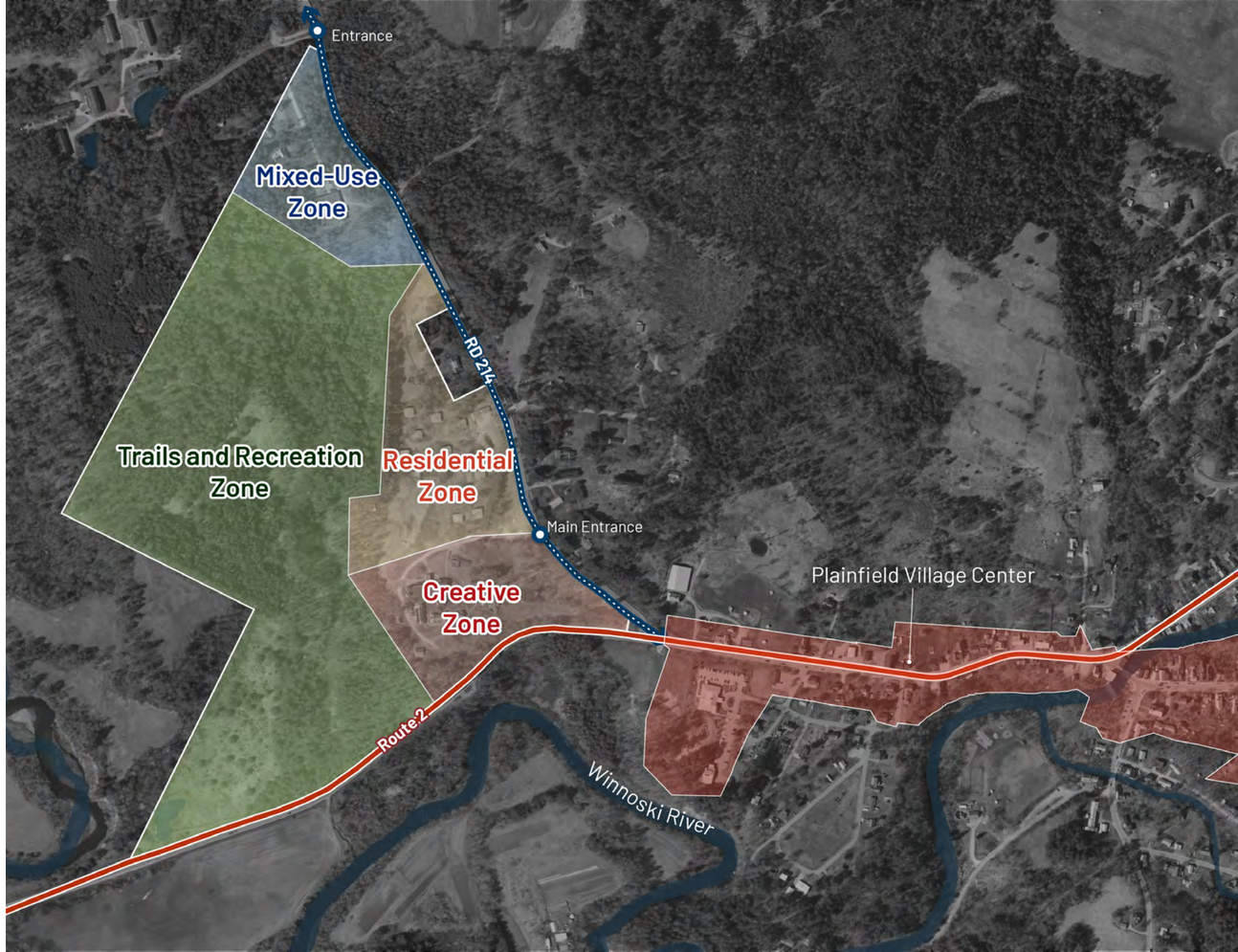
TRAILS AND RECREATION ZONE

The western edge of the Goddard College site makes up the Trails and Recreation Zone. This zone will enhance and expand the existing trail network by leveraging the site's natural beauty. Trails will connect Goddard College to the Plainfield Village Center, promoting walkability and recreational opportunities for residents and visitors.

KEY PRIORITIES:

1. Balancing housing, creativity, and connectivity.
2. Preserving Goddard's historical and cultural legacy.

The redevelopment of Goddard College is an opportunity to address Plainfield's housing crisis by repurposing existing structures and creating new residential units. Simultaneously, the creative zone will preserve and expand cultural and artistic spaces, fostering a vibrant community hub. Connectivity within and to Goddard College will be enhanced through infrastructure improvements such as new roadways, trail expansions, and sidewalk extensions to the Village Center. Moreover, it is vital to acknowledge the historical significance of Goddard College, which can be achieved by prioritizing the adaptive reuse of iconic buildings on site. Initiatives proposed on the site should align with the college's artistic and educational legacy. Additionally, redevelopment efforts should align with the community's values while creating new opportunities for growth and engagement.



CREATIVE ZONE DEVELOPMENT

The Creative Zone is the heart of the redevelopment plan for Goddard College, encapsulating its historical legacy and transforming it into a vibrant center for housing, art, and cultural engagement. This zone presents a unique opportunity to address critical community needs while preserving and enhancing the site's historical and creative significance. In this zone, we propose building alternative housing opportunities, an artistic community hub, and improving transit connections.

Group Activity Outside Goddard's Clockhouse
Image Source: Goddard College Instagram

ALTERNATIVE HOUSING OPPORTUNITIES:

At the core of the Creative Zone's development strategy is repurposing three historic buildings—Martin Manor, Kilpatrick Dorm, and the Clockhouse—into alternative housing units. These buildings offer over 12,800 square feet of indoor space, providing an efficient and cost-effective solution to Plainfield's housing crisis. Given Plainfield's current conditions and social demographics, we recommend two potential applications to address pressing housing needs. We encourage the new owners to build one of the two types of proposed alternative housing.

Map Highlighting Buildings Considered for Alternative Housing Conversion

TRANISTIONAL HOUSING

Recent floods have displaced many Plainfield residents, highlighting an urgent need for immediate housing solutions. The adaptive reuse of these buildings can provide transitional housing, offering temporary but secure accommodations for those in need. The strategic location and existing infrastructure of buildings within the Creative Zone make it an ideal site for this purpose, enabling a faster turnaround compared to new construction projects.

SENIOR LIVING FACILITIES

Alternatively, with over 20% of Plainfield's population aged 65 or older, senior living facilities represent another pressing community need. The Creative Zone can accommodate assisted living or senior-friendly units designed to support aging residents while keeping them connected to the community. This approach aligns with Vermont's demographic trends and positions the site as a model for thoughtful, future-focused development.

Senior Living Facility in Spokane, Washington
Image Source: Benjamin Benschneider

Example of Common Areas in Transitional Housing
Image Source: Providence Network

IMPROVING ON-STREET ACCESS

To maximize the potential of the Creative Zone, we propose extending the road at its southern edge to connect directly with Route 2. This extension will improve accessibility, enhance visibility, and better integrate the zone with surrounding areas, fostering seamless connectivity and ease of use for residents and visitors.

ARTISTIC COMMUNITY HUB:

The Creative Zone also embraces its historical role as a cultural and artistic center. Many buildings in this zone have significant potential. Apart from Kilpatrick Dorm and Martin Manor, which provide housing opportunities, the existing Haybarn Theatre and Music Building offer a solid foundation for a dynamic artistic community hub.

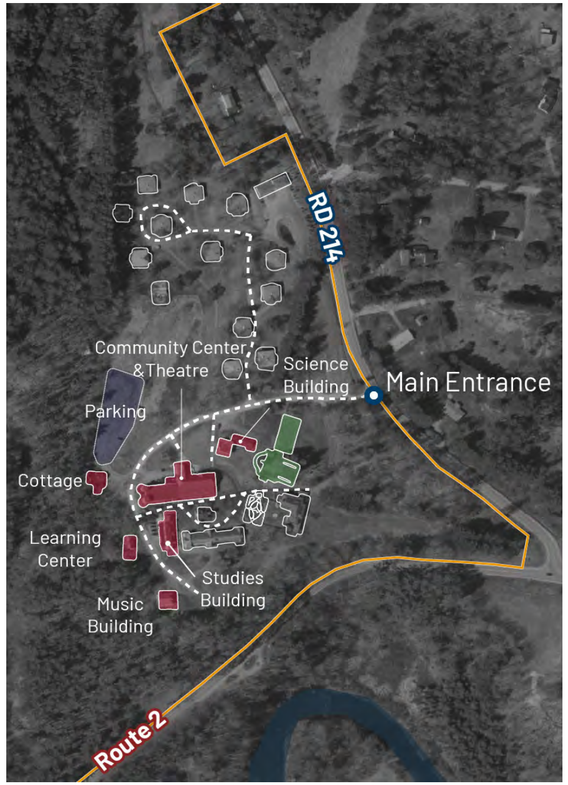
By repurposing these facilities, the Creative Zone can host a wide range of activities, including art exhibitions, performances, workshops, and community events, which were previous uses of the space. These initiatives will enrich Plainfield's cultural life and attract visitors and creatives from across Vermont and beyond.

ESTABLISH ARTIST RESIDENCY PROGRAMS

Drawing inspiration from successful models such as the Vermont Studio Center and Marble House Project, the Creative Zone can host multidisciplinary artist residency programs. These programs can:

- Provide dedicated spaces for artists to create and collaborate.
- Support the local economy through cultural tourism and events.
- Foster a vibrant creative ecosystem that aligns with Plainfield's artistic culture.

Given Plainfield's artistic culture, this has potential. We also see its potential given the precedence of successful artist residencies in Vermont, such as the Vermont Studio Center and the Marble House Projects. The Vermont Studio Center operates year-round, simultaneously supporting over twenty multidisciplinary artists. In comparison, the seasonal Marble House Project accommodates up to eight artists and supplements revenue with private events. Goddard College can draw inspiration from these models to create a tailored, financially viable residency program that fosters creativity and cultural exchange. With its existing infrastructure and historical ambiance, the Creative Zone is uniquely positioned to become a premier destination for artists and cultural enthusiasts.



Map Highlighting Buildings Considered for the Artistic Community Hub

Art Crawl at Goddard College
Image Source: Goddard College Instagram

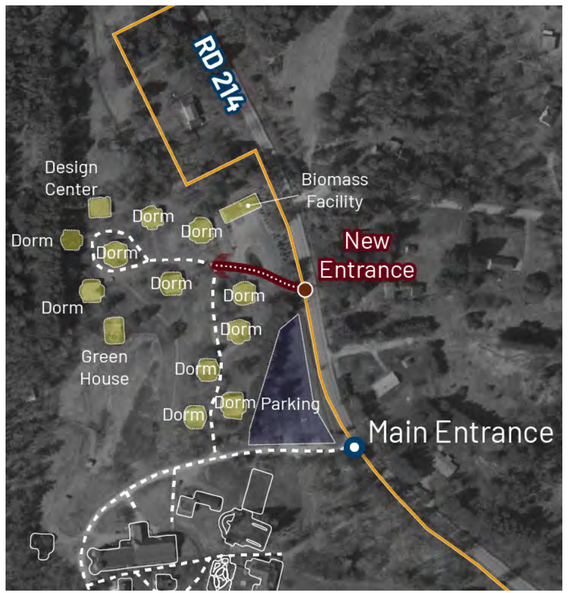
Marble House Project Campus
Image Source: Cultural Reproducers

Vermont Studio Center Campus
Image Source: Erica Buist

Artist at Vermont Studio Center
Image Source: Vermont Studio Center

RESIDENTIAL ZONE DEVELOPMENT

The Residential Zone at Goddard College represents a cornerstone of this redevelopment project, with its potential to address Plainfield's acute housing shortage while fostering a more vibrant, inclusive community. This phased plan lays out a compelling vision for the future by leveraging the zone's existing infrastructure and strategic location.



Map Highlighting Buildings Considered for the Phase 1 Expansion

Goddard College Dorms

MULTI-FAMILY HOUSING TRANSFORMATION (PHASE 1)

The initial phase focuses on the adaptive reuse of existing dormitories and the design center. With over 50,000 square feet of convertible indoor space, this initiative could generate between 80 and 130 multi-family residential units, providing critical housing options for the town. This approach prioritizes efficiency by utilizing already-built structures, reducing both costs and construction timelines compared to new builds.

The conversion process emphasizes rented multi-family apartments that cater to a diverse population, from young families to professionals seeking proximity to Plainfield's village center. As part of the redevelopment, we would recommend the addition of a new entrance along Road 214, which will ensure seamless access to the residential area, improving traffic flow and enhancing the overall experience for future residents. This dedicated access point will also create a sense of community and identity unique to this zone, positioning it as a vibrant neighborhood within the larger redevelopment.

HIGH-DENSITY HOUSING EXPANSION (PHASE 2)

Building on Phase 1, the second phase proposes converting underutilized parking lot space into medium- to high-density housing. This move maximizes the potential of the Residential Zone while aligning with Vermont's broader goals for sustainable and efficient land use. The high-density approach not only accommodates more residents but also fosters a more connected, walkable community.

By integrating additional housing units within this zone, the project helps Plainfield address its housing needs, particularly in the wake of flood-related displacement. These high-density options will provide affordable living solutions, strengthening the town's ability to retain and attract residents while contributing to its economic resilience.

Example of Heartbreak Hotel, a Medium-Density Apartment
Image Source: Rumble Strip Vermont

MAXIMIZING COMMUNITY IMPACT

The Residential Zone development is a vital component of the broader vision for Goddard College, addressing Plainfield's immediate and long-term housing challenges. Through thoughtful, phased planning, this redevelopment creates new opportunities for residents to live close to amenities, fosters a stronger sense of community, and helps the town meet its housing needs sustainably and efficiently.

This plan not only revitalizes underutilized spaces but also creates homes that honor the area's unique character and history. The project sets the stage for Plainfield's continued growth and prosperity by transforming the Residential Zone into a dynamic, thriving neighborhood.

Map Highlighting Buildings Considered for the Phase 2 Expansion

MIXED-USE ZONE DEVELOPMENT

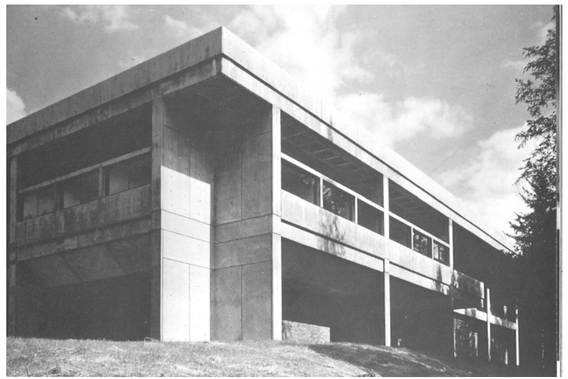
The Mixed-Use Zone at Goddard College offers a unique opportunity to blend preservation with innovation, ensuring that this area becomes a thriving, multi-functional hub that serves both Plainfield and the broader region. By retaining the zone's valuable existing uses and unlocking its long-term development potential, this plan lays the groundwork for an exciting opportunity.

PRESERVING EXISTING USES

At the heart of the Mixed-Use Zone is the Eliott D. Pratt Center Library, which houses the WGDR/WGDH radio station. The WGDR/WGDH offers a vital outlet for independent and alternative media, connecting local voices to a broader audience. As a primarily volunteer-run station, it embodies the spirit of collaboration and grassroots engagement that defines Plainfield.

Preserving these institutions is key to maintaining the zone's cultural and historical significance. By protecting and supporting their continued operation, the redevelopment ensures that the Mixed-Use Zone remains a center for learning, creativity, and community connection.

CVCR Programmers Outside the Library
Image Source: Central Vermont Community Radio



Eliott D. Pratt Center Library
Image Source: Goddard College Archives

Buildings Built by Goddard Students
Image Source: Teen Vogue

LONG-TERM DEVELOPMENT POTENTIAL

Looking ahead, we have identified approximately 3.8 acres of undeveloped land in the Mixed-Use zone, representing an exciting opportunity for future growth. This area can be transformed into a dynamic mixed-use space that combines residential and commercial development, addressing critical needs while fostering economic activity. Medium-density housing or mixed-use buildings with retail and office spaces would align with Vermont's emphasis on sustainable, compact development, providing new housing options and supporting local businesses.

This approach ensures the zone becomes a self-sustaining economic hub, attracting new residents, visitors, and investment to Plainfield. By carefully planning this development, the project maximizes the land's potential while maintaining its compatibility with the surrounding community.

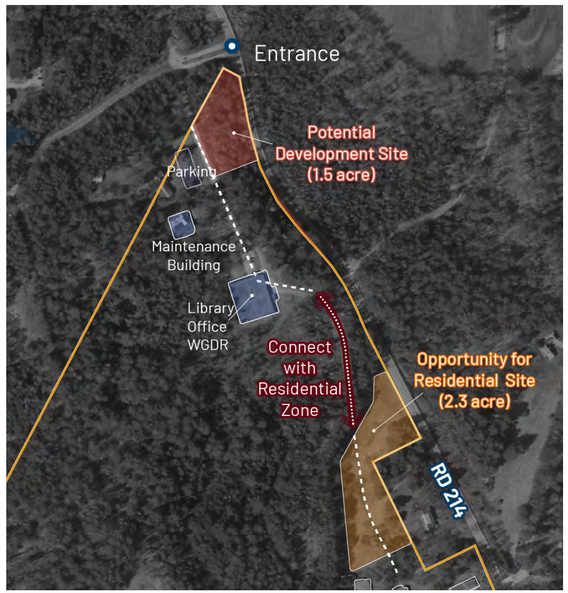
ENHANCING CONNECTIVITY

To fully realize the potential of the Mixed-Use Zone, it is crucial to strengthen its physical and functional connections to the Residential Zone. Improved pathways, shared public spaces, and cohesive design elements can create a seamless flow between these areas, fostering a sense of unity across the redevelopment site. This connectivity not only enhances accessibility but also encourages interaction and collaboration among residents, businesses, and visitors.

A VISION FOR THE FUTURE

The Mixed-Use Zone development is a long-term proposal for the Goddard College site that balances preservation with forward-thinking innovation. This plan transforms the Mixed-Use Zone into a vibrant hub of activity and opportunity by maintaining the library and radio station as vital community resources, utilizing undeveloped land for dynamic growth, and enhancing connectivity with other zones.

This thoughtful approach ensures that the zone contributes to Plainfield's cultural, social, and economic resilience, creating a lasting impact that honors the town's legacy while paving the way for its future.



Map Highlighting Mixed-Use Development Zone

TRAILS AND RECREATION ZONE DEVELOPMENT

The Trails and Recreation Zone at Goddard College offers a unique opportunity to weave the natural beauty of Plainfield into the fabric of the town's redevelopment. This zone becomes a space for recreation, community engagement, and environmental stewardship by restoring and expanding trails and creating stronger connections to the village center.

ENHANCING WALKABILITY AND ACCESS

Based on our conversations with locals, we learned about trails on the site that Goddard College previously maintained. We recommend restoring these pathways as the first step in reestablishing the site as a hub for outdoor activities. Beyond restoration, expanding the trail network will allow for greater exploration of the college's 114-acre property, encouraging residents and visitors to experience its natural beauty firsthand.

To maximize the impact of this effort, the expanded trail system will connect seamlessly with sidewalk extensions into Plainfield's village center. This integration creates a walkable and bikeable corridor that promotes sustainable transportation and strengthens ties between the site and the broader community. These connections enhance accessibility for residents and position Goddard College as a notable node in Plainfield's recreational network.

BUILDING A SHARED VISION

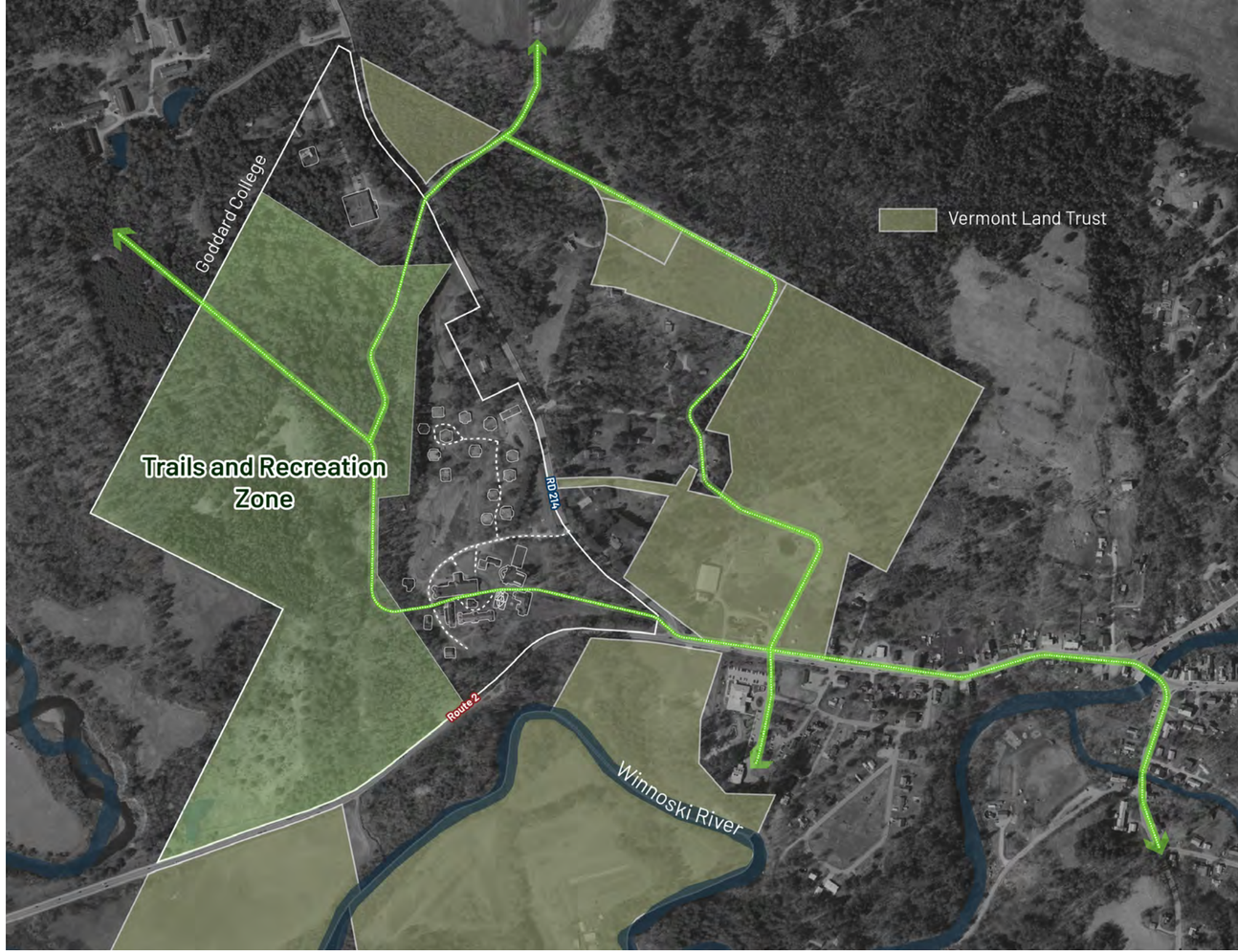
The success of the Trails and Recreation Zone hinges on its ability to meet the needs and aspirations of Plainfield's residents. Incorporating local input into the planning and design process ensures that these recreational spaces reflect the community's priorities. Whether it's adding features like benches, interpretive signage, or picnic areas, this collaborative approach guarantees that the trails and surrounding spaces become a welcoming resource for all.

Community engagement also fosters a sense of shared ownership and pride in the trails, encouraging residents to participate actively in their maintenance and promotion. This collective stewardship strengthens the zone's role as a vital community asset.

A PATH FORWARD FOR PLAINFIELD

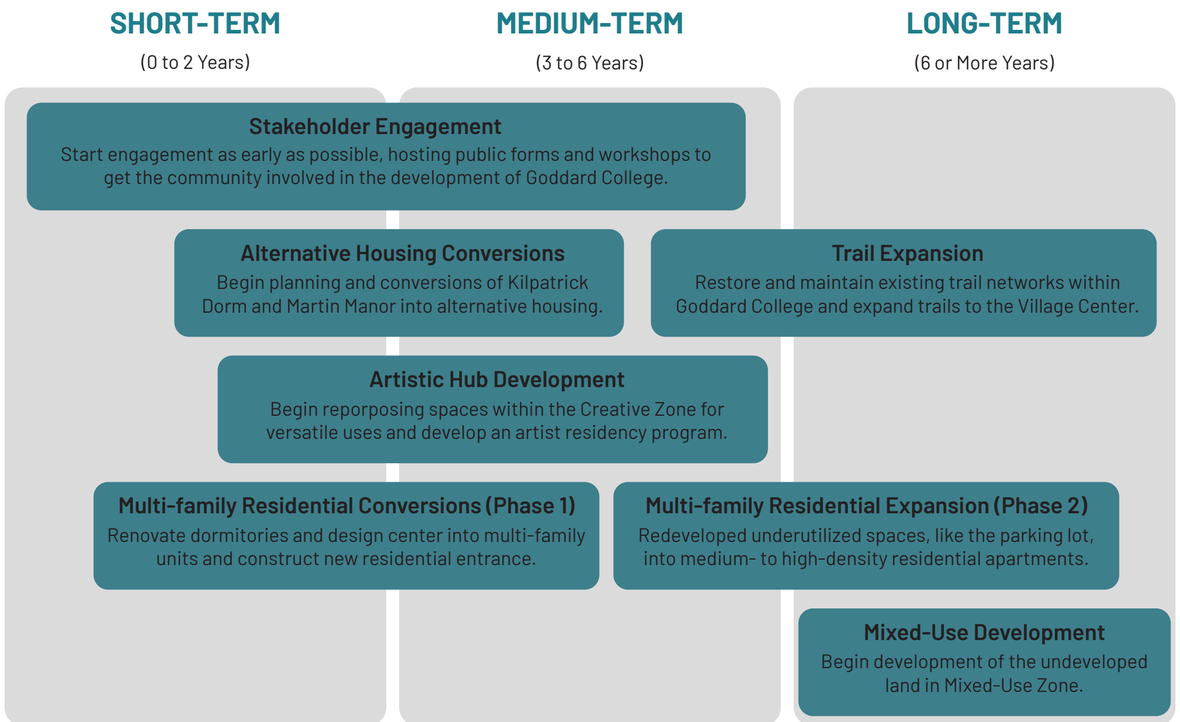
The Trails and Recreation Zone is more than a series of pathways—it bridges Goddard College's storied past and promising future. By restoring and expanding trails, connecting them to Plainfield's village center, and incorporating community input, this zone becomes a symbol of sustainability, accessibility, and collaboration.

This vision transforms the Trails and Recreation Zone into a space where residents and visitors can connect with nature, engage with the community, and experience the revitalized Goddard College as a cornerstone of Plainfield's identity and growth.



PROJECT IMPLEMENTATION TIMELINE

This timeline demonstrates how the projects in this proposal can be strategically phased, transitioning from short-term implementation to long-term development. We strongly encourage initiating community engagement at the earliest stages and maintaining active collaboration throughout the planning and development process to ensure the project aligns with the needs and aspirations of Plainfield's residents.



CONCLUSION

The redevelopment of Goddard College represents a pivotal moment for Plainfield—a chance to address urgent needs while laying the foundation for a more vibrant, inclusive, and sustainable future. At its core, this plan seeks to achieve three interconnected goals: providing innovative housing solutions, creating dynamic community spaces, and preserving the cultural and historical legacy of the site. By leveraging Goddard's unique assets, the redevelopment aligns seamlessly with Plainfield's long-term growth and resilience goals.

Each proposed zone—the Creative Zone, Residential Zone, Mixed-Use Zone, and Trails and Recreation Zone—offers a distinct yet complementary opportunity to enhance the lives of Plainfield's residents. Together, these zones address critical challenges such as housing shortages, economic sustainability, and community connectivity while embracing the creativity, heritage, and natural beauty that define the town.

This transformative vision will not succeed in isolation. It calls for collaboration among all stakeholders, including residents, local officials, developers, and community organizations, to ensure the redevelopment reflects shared values and priorities. By working together, we can reimagine Goddard College as a space that serves the community's needs today and inspires future generations.

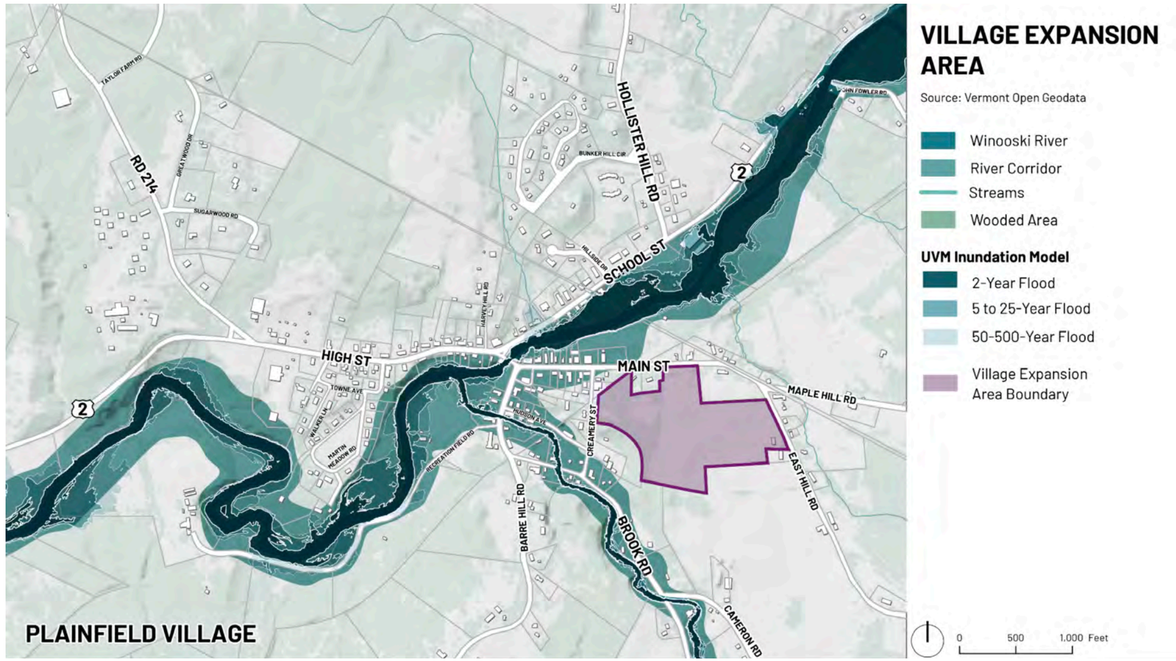
Now is the time to act. Plainfield stands at a crossroads with an unprecedented opportunity to create a resilient, inclusive, and thriving future. This is a chance to bring this vision to life and honor the enduring legacy of Goddard College as a cornerstone of creativity, community, and growth.

IV: DEVELOPMENT OPPORTUNITIES
IV.2: VILLAGE EXPANSION AREA

The Village Expansion Area will offer thoughtfully designed housing that meets the needs of both displaced and new residents, providing a safe and sustainable community outside the floodplain. This development will balance growth with environmental stewardship, preserving the ecological integrity of this previously undeveloped land while fostering a vibrant and resilient addition to the village center.

SITE OVERVIEW

The village expansion area is located close to the village center but outside of the floodplain, posing as a great sight for development and opportunity for expansion of the village. The area is also located within the village center buffer which expedites the Act 250 permit process for development of housing. Zoning for the area is classified under village residential, and the land is currently owned by a local resident with plans to sell to the town.



ASPIRATIONS FOR THE SITE

The purpose of the plan for this area can be exemplified through the Plainfield Village Expansion Survey Analysis which was conducted by members of the town overseeing the project. According to that document:

"**This project is:** Trying to make it possible for **people who live here to stay**, and creating space for **people who want to move here** to be able to. We will find a way to **prioritize the sale** of these lots to people **already living in Plainfield**, those **displaced by the floods**, and those who will live in the houses built on these lots."

Flood Damage in Plainfield; Image Source: Plainfield Studio

Village Expansion Area; Image Source: Plainfield Studio

"**This project is not:** Selling all developable land to the **highest bidder** or making Plainfield **less affordable** for people who pay property tax or rent."

Additionally, this studio's role in the project is:

"...to provide food for thought for the public design process"

Source: Plainfield Village Expansion Survey Analysis

PLAINFIELD VILLAGE EXPANSION SURVEY

Acknowledgment of Community Input

While our studio did not conduct the community survey, it was designed and administered by the town to capture residents' perspectives on housing and infrastructure. The insights gathered from the survey have been instrumental in guiding the analysis and recommendations presented in this project. This page highlights the role of community input and provides a summary of the survey results. Key focus areas of the survey were housing preferences, non-housing priorities, and anticipated project impacts.

1. Initial Housing Needs

- Strong support for mixed housing types: single-family homes (36%), multi-family units (44%), and duplexes.
- Affordable and senior-friendly housing emphasized (28% and 16%, respectively).
- Frequent calls for energy-efficient designs.

2. Long-Term Housing Vision

- Support for high-density, community-oriented designs.
- Solar integration and alignment with village aesthetics prioritized.

3. Non-Housing Priorities

- Parks and Green Spaces (36%)
- Community Centers (27%)
- Grocery Stores/Shopping (24%)
- Walkability (19%)
- Environmental considerations like stormwater management and solar energy were also valued.

4. Anticipated Impacts

- Positive (37%): Community growth, walkability, and economic benefits.
- Concerns (26%): Traffic, noise, and preserving rural character.
- Conditional Support (21%): Depends on project execution.

The Heartbreak Hotel; Image Source: Vermont Digger

Home in Plainfield Village; Image Source: Century 21 Farm & Forest

SITE PRIORITIES

PRIORITY #1: HOUSING

Housing is central to the success of Vermont's climate resiliency efforts, particularly in Plainfield, where recent floods have displaced residents and exacerbated the state's ongoing housing shortage. Addressing these challenges, housing development within the village expansion area offers a vital opportunity to rebuild and strengthen the community. Insights from the Plainfield Village Expansion Survey indicate strong resident support for a range of housing options, including **mixed housing typologies** such as **single-family and multifamily units.** This diversity ensures a variety of living options to meet different household needs.

Furthermore, **prioritizing affordability and accessibility** is essential to equitably address the region's housing crisis, ensuring that people of all income levels and abilities can secure stable homes. Promoting **high-density housing** in the expansion area makes efficient use of limited land while helping to foster a close-knit, vibrant community. Such development not only aligns with resident feedback but also supports broader climate goals by maximizing land use while preserving Vermont's cherished landscapes.

PRIORITY #2: SUSTAINABLE DESIGN

Sustainable design principles are integral to enhancing Plainfield's climate resilience and aligning with community priorities. According to the Plainfield Village Expansion Survey, residents expressed a strong desire for **open space** as part of the village expansion, underscoring the importance of balancing development with areas that promote recreation, connection, and ecological health.

Key design strategies include **orienting buildings to respond to the local sunpath,** maximizing natural light and energy efficiency throughout the year. Thoughtful **water management** is also essential, with provisions to capture and channel runoff water into wetlands, restoring ecological balance and reconnecting flows to the Winooski River. Additionally, **planning for green corridors** provides vital connections between open spaces, fosters biodiversity, and supports the town's commitment to sustainability and community well-being.

CASE STUDY: ECOVILLAGE AT ITHACA, NY

Ecovillage Ithaca serves as a model for ecological design, demonstrating how thoughtful planning can harmonize development with environmental stewardship. The village minimizes its impact on the land by prioritizing pedestrian pathways, significantly limiting car access and fostering a walkable, community-focused environment. Additionally, the development adheres to passive house design principles, achieving an exceptional standard of energy efficiency. These principles emphasize airtight construction, superior insulation, and strategic use of natural light, reducing the village's overall energy consumption while enhancing comfort for residents. Ecovillage Ithaca exemplifies how sustainable design practices can create vibrant, low-impact communities.

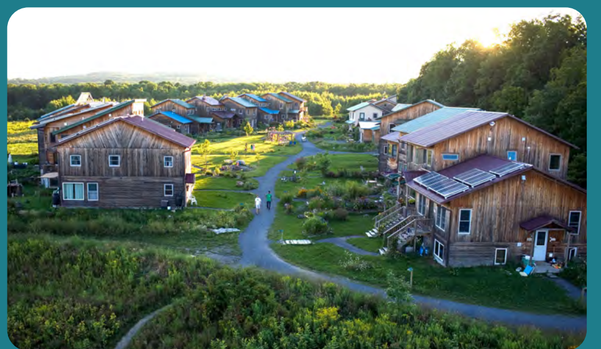
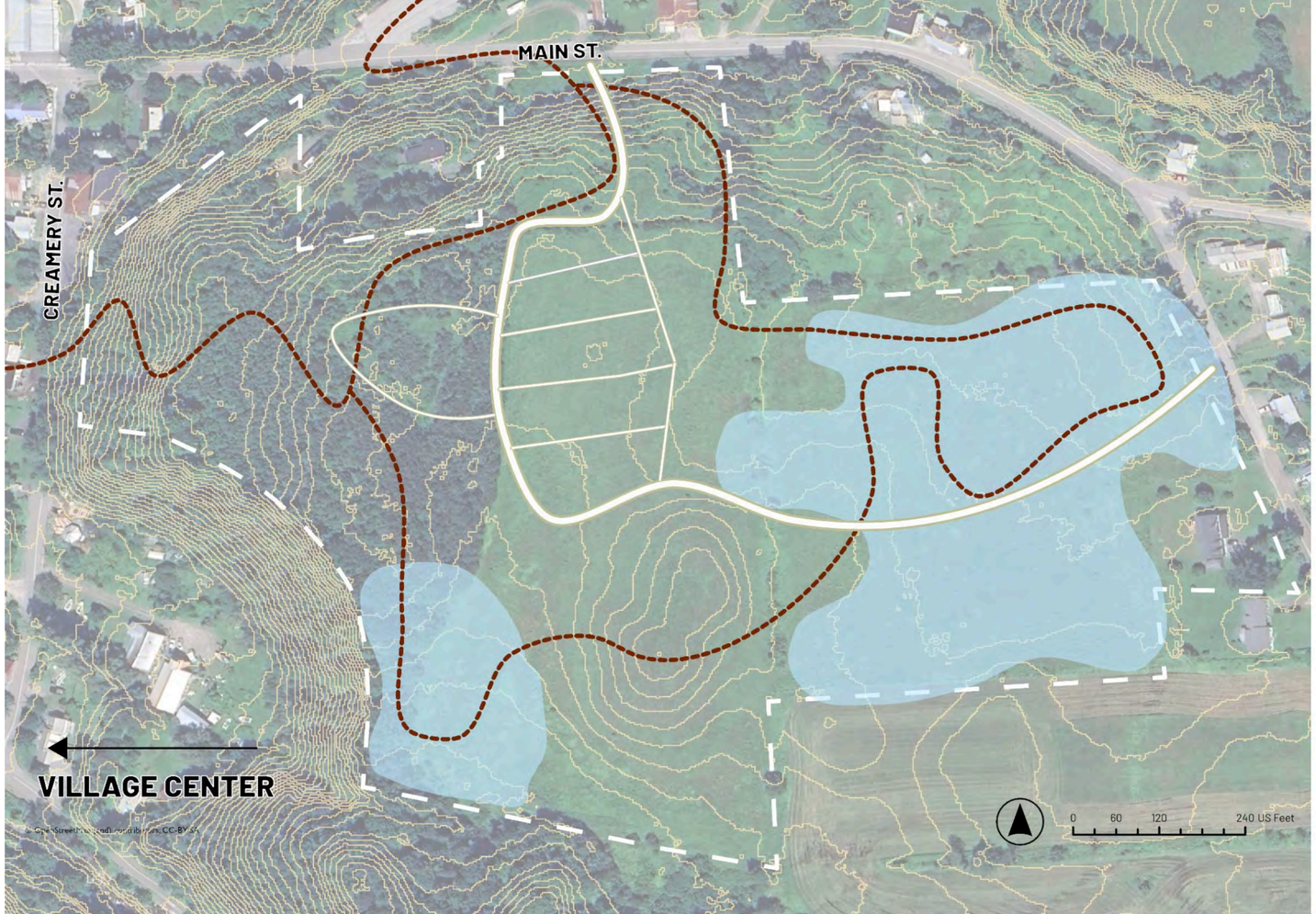


Image Source: Ecovillage Ithaca

KEY CONSIDERATIONS FOR DEVELOPMENT

The Plainfield Village Expansion Area offers unique opportunities and challenges that shape its development strategy. A significant elevation gain from Creamery Street and Main Street defines the area's topography, requiring careful planning to balance accessibility with preservation of the landscape. Additionally, the presence of a Class-II wetland within the expansion area necessitates environmentally sensitive design approaches to protect this valuable ecological feature.

To ensure effective connectivity, development plans prioritize the creation of access points, including a single paved road through the area, with dirt roads branching into housing clusters. This layout balances efficient circulation with minimal environmental disruption. A pedestrian trail network is also integral to the plan, connecting the expansion area to the village center and linking with the Cross Vermont Trail, fostering walkability and enhancing the area's recreational and transportation options. Together, these features set the stage for a resilient and sustainable expansion that aligns with community needs and environmental priorities.



VILLAGE EXPANSION AREA

ACCESS POINTS

PAVED ROAD

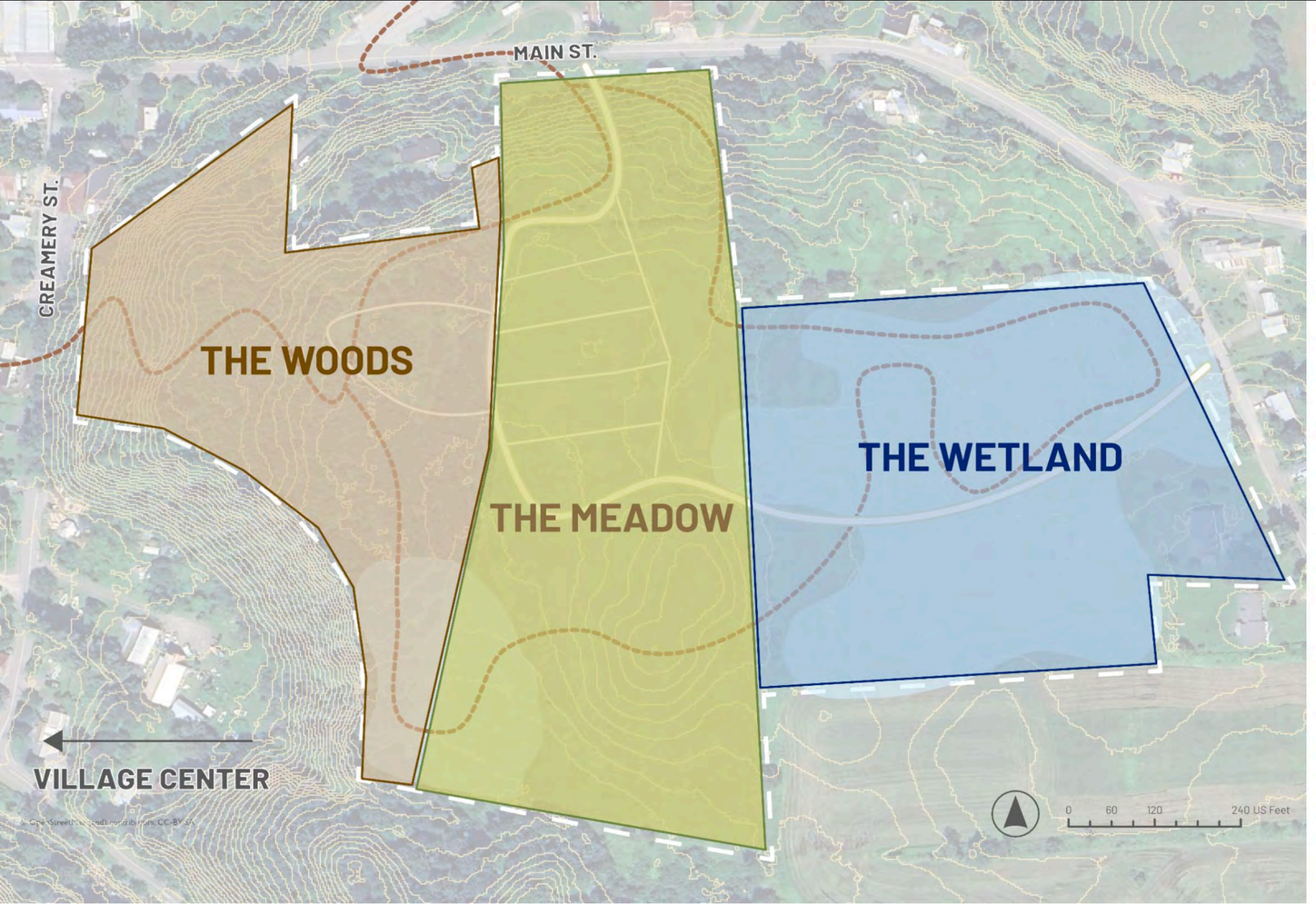
DIRT ROADS

PEDESTRIAN TRAIL

WETLAND

ROAD

PEDESTRIAN TRAIL



VILLAGE EXPANSION AREA

WETLAND

ROAD

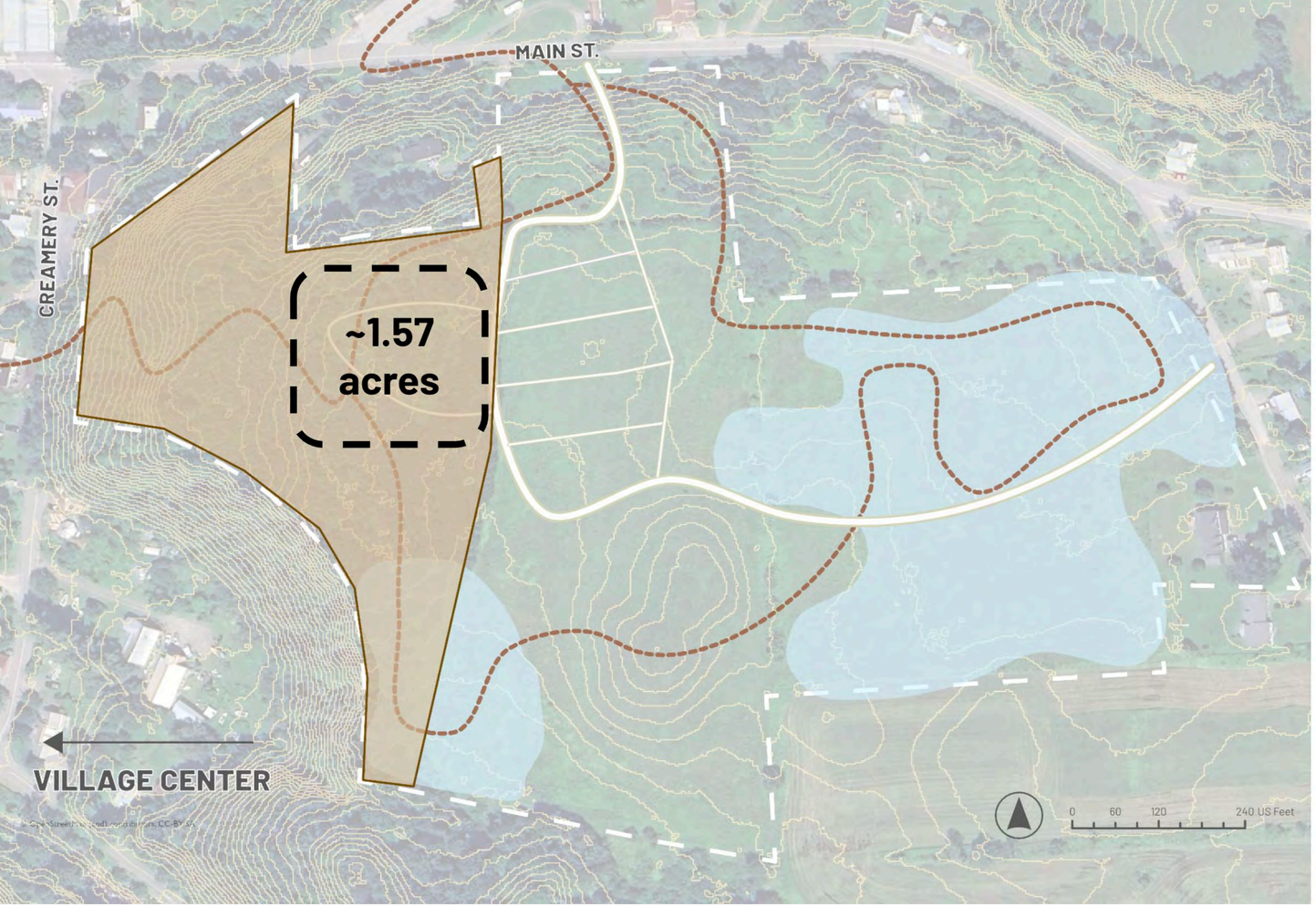
PEDESTRIAN TRAIL

VILLAGE EXPANSION AREA ZONES

THE WOODS
A low-density residential area preserving the forested environment.

THE MEADOW
A medium-density housing zone complemented by open space and scenic views.

THE WETLAND
A conservation zone protecting class-II wetland and foestering ecological stewardship.



VILLAGE EXPANSION AREA

THE WOODS

Number of Lots

~5

Lot size

0.3 acre

Housing Types

Single Family

WETLAND

ROAD

PEDESTRIAN TRAIL

OPPORTUNITIES FOR DEVELOPMENT

THE WOODS

Purpose: A low-density residential area preserving the forested environment.

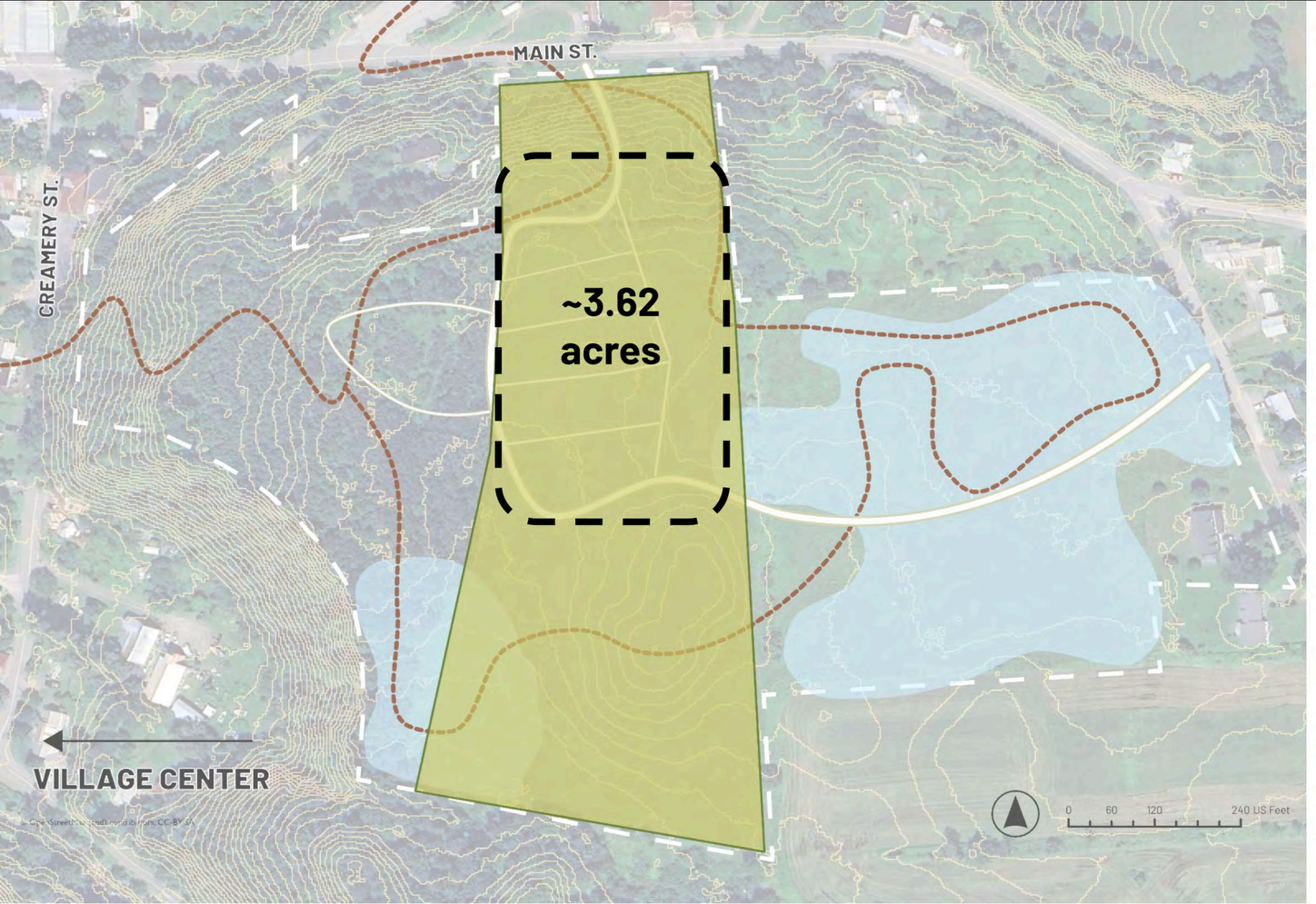
Total Area for Housing: ~1.57 acres

Number of Lots: ~5

Lot Size: ~0.3 acres per lot

Housing Types:
Single-family homes integrated into the wooded landscape.

Design Considerations:
- Minimal tree clearing through sustainable construction methods.
- Dirt road access to reduce impact on the natural environment.



VILLAGE EXPANSION AREA

THE MEADOW

Number of Lots

Up to 28

Minimum Lot Size

⅛ acre

Housing Types

Single Family

Multifamily

WETLAND

ROAD

PEDESTRIAN TRAIL

OPPORTUNITIES FOR DEVELOPMENT

THE MEADOW

Purpose: A medium-density housing zone complemented by open space and scenic views.

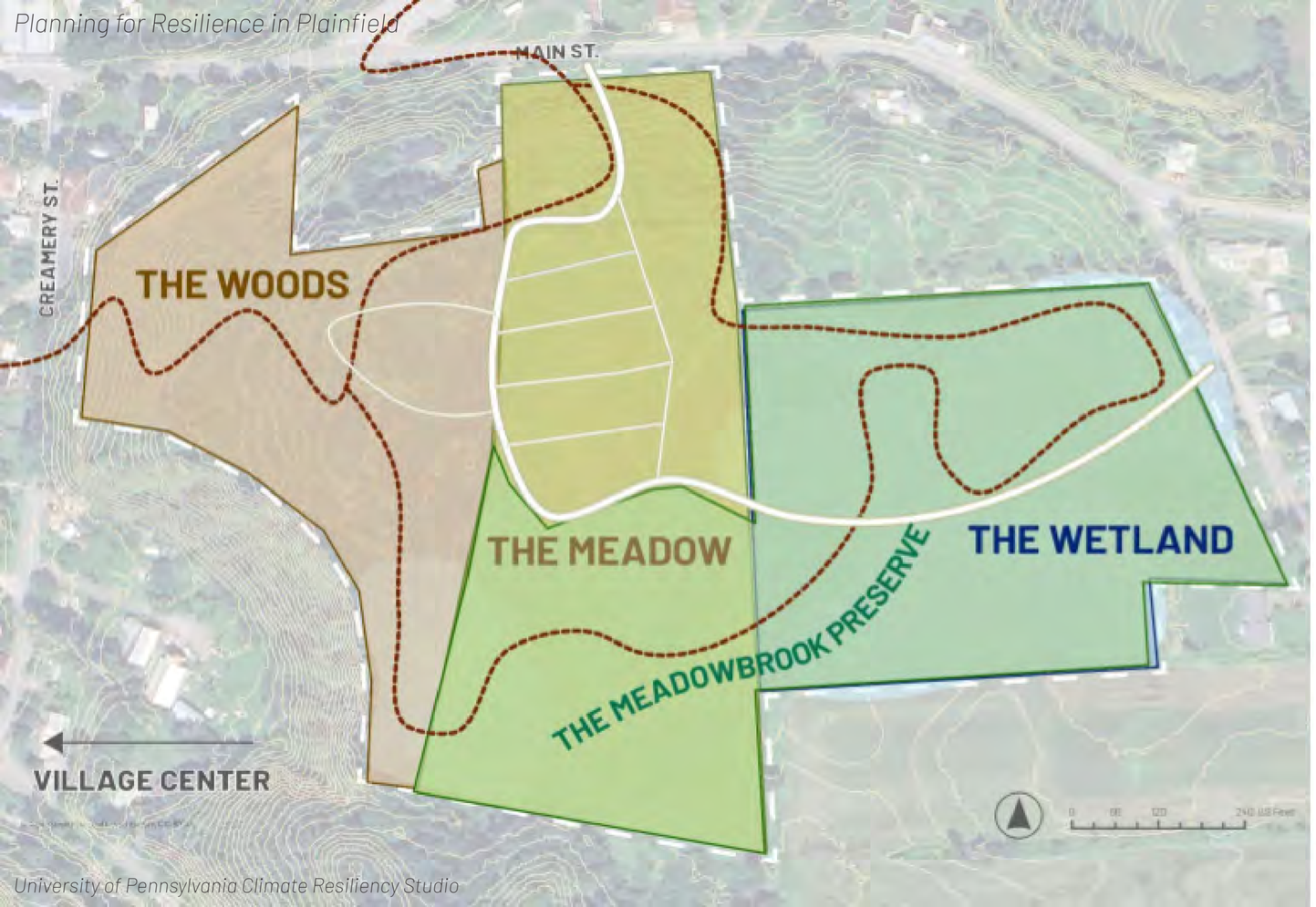
Total Area for Housing: ~3.62 acres

Number of Lots: Up to 28

Minimum Lot Size: 1/8 acre per lot

Housing Types:
- Single-family homes
- Multifamily units

Design Considerations:
- Housing layout optimized for density while preserving open space.
- Shared green spaces or community gardens to maintain the pastoral charm.
- Dirt roads branching from a main paved road to serve housing clusters.



VILLAGE EXPANSION AREA

~47-94+ UNITS

ADDITIONAL OPEN SPACE

TRAIL CONNECTION TO VILLAGE

MODEL FOR ECOLOGICAL VILLAGE PLANNING

WETLAND

ROAD

PEDESTRIAN TRAIL

OPPORTUNITIES FOR SUSTAINABILITY

THE WETLAND

Purpose: A conservation zone protecting the Class 2 wetland and fostering ecological stewardship.

Development: No housing development to preserve the wetland's integrity.

Features:

- Wetland restoration projects and sustainable water management infrastructure.
- Educational signage and trails to promote understanding and enjoyment of the ecosystem.

THE MEADOWBROOK PRESERVE

Location: Extending through The Meadow and The Wetland zones.

Features:

- Pedestrian Trails: Low-impact paths connecting the preserve with the village center, housing areas, and the Cross Vermont Trail.
- Scenic Views: Opportunities to appreciate the natural beauty of the meadow, wetland, and surrounding landscape.
- Sustainability Emphasis: Trails and wetland integration designed to align with sustainable development priorities, ensuring minimal ecological disruption.

IMAGINING THE VILLAGE EXPANSION AREA

Picture a vibrant, thoughtfully designed neighborhood seamingly connected to Plainfield's village center, a haven for residents seeking safety, community, and sustainability. The Village Expansion Area comes alive as a harmonious blend of housing, open space, and ecological stewardship, embodying the vision of a resilient future.

The Woods

At the edge of the site, the woods provide a secluded enclave of five single-family homes. These residences are thoughtfully spaced across the 1.57 acres of developable woodland, preserving the natural landscape and offering a sense of privacy. The homes, designed to Passive House standards, blend seamlessly with their surroundings, incorporating natural materials and minimal footprints to reduce environmental impact. Walking along the wooded paths, you can walk directly to the village center with ease.

Single-Family Home in Wooded Area; Image Source: Apartment Therapy

Eco-friendly Multifamily Housing; Image Source: Ecovillage Ithaca

The Meadow

Further down the slope, the meadow opens into a vibrant hub of housing diversity. Up to 28 homes, ranging from single-family residences to multifamily units, sit on carefully planned lots that take advantage of the 3.62 acres of open land. Designed with a balance of community and privacy, these homes are interwoven with shared green spaces and pedestrian pathways. The meadowbrook preserve winds through this zone, inviting residents to stroll along low-impact trails and enjoy scenic views of the surrounding hills.

Walking Path; Image Source: Ecovillage Ithaca

The Wetland

The wetland area is left largely untouched, serving as an essential ecological asset and natural buffer. Here, the meadowbrook preserve transitions into a serene haven, with trails providing gentle access for residents to appreciate the natural environment. Educational signage highlights the role of wetlands in flood mitigation and water purification, connecting visitors to the site's environmental importance.

Connectivity and Sustainability

Beyond the roadways, the pedestrian trail system ties the entire expansion area together, creating an easy connection to the village center and the Cross Vermont Trail. The Village Expansion Area is a testament to the possibilities of thoughtful, community-oriented design, offering a home to displaced and new residents.

RECOMMENDATIONS FOR IMPLEMENTATION

1. Community Engagement and Stakeholder Involvement

Pre-Development Engagement:

- Host initial surveys and focus groups.
- Conduct workshops and public meetings.
- Establish official local advisory meeting and record meetings for the public.

Ongoing Engagement:

- Post regular updates to local outlets such as the Facebook group.
- Create mechanisms for ongoing feedback.

2. Phased Development Plan

Phase 1: Infrastructure and Access (Year 1-2)

- Subdivide land into designated zones and issue zoning codes emphasizing sustainability.
- Establish a clear framework for how developers can access the land, outlining building permits and green building standards.
- The town will oversee the construction of the primary access road.
- Implement roadways that include non-motorized transport routes.

Phase 2: Housing and Community Features (Year 2-4)

- Incentivize passive house and green building practices (density bonuses, tax breaks, etc.)
- Develop and adopt a "green building" checklist as part of the permitting process.
- Maintain and update zoning regulations to ensure density levels are in line with town objectives.

Phase 3: Final Housing Completion and Public Amenities (Year 4-6)

- Encourage developers to integrate renewable energy sources into the final stages of construction.
- Establish systems for water recycling, stormwater management, and waste diversion.

3. Environmental Sustainability and Stewardship

Environmental Standards and Regulations:

- Mandate the protection of the wetlands, with measures in place to ensure ongoing restoration and preservation.
- Conduct regular audits of developers to ensure adherence to passive house standards and other green building practices.
- Establish a "Meadowbrook Preserve" for low-impact recreational activities and environmental education.

4. Funding and Partnerships

State and Federal Grants:

- Explore funding sources for specific environmental projects (i.e. Vermont Department of Environmental Conservation grants).

5. Monitoring and Evaluation

Community Feedback:

- Conduct annual surveys and public meetings to gauge resident satisfaction and identify areas for improvement.

Hiring Full-Time Staff to Oversee the Project:

- Given the complexity and long-term nature of this project, the town should prioritize hiring a full-time staff member to oversee and manage the development process, including coordinating between developers, stakeholders, and the community.
- A full-time staff person will help prevent volunteer burnout, maintain project momentum, and ensure that goals related to sustainability, community involvement, and housing needs are being met effectively.
- This role will also help monitor progress, manage funding, and act as a point of contact for all involved parties, ensuring accountability and transparency throughout the development process.

V: PUBLIC SPACE IMPROVEMENTS
V.1: CHICKEN IT'SA PARK

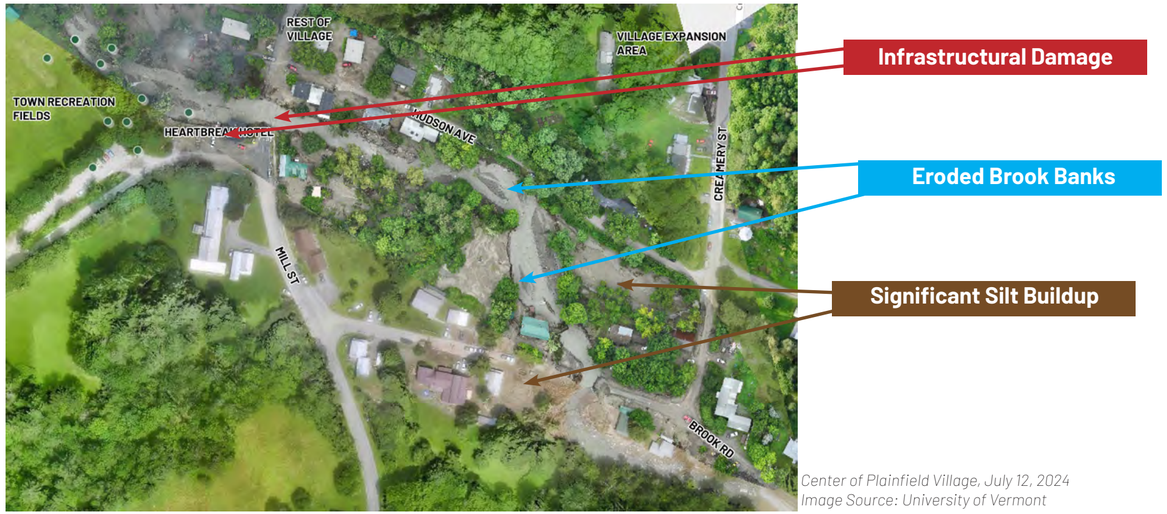
Chicken It'sa Park will convert bought-out properties into a beautiful, serene public space for Plainfield residents right in the heart of the village, while also knitting together different parts of town and strengthening flood resiliency.

DAMAGE IN THE VILLAGE

As addressed earlier in this report, Plainfield Village was damaged the most by the 2024 flooding. In the image below, one can see the Great Brook snaking through the middle of the village, its path significantly widened due to erosion along its banks. When the flood waters finally subsided, massive deposits of silt and sediment were also caked over local streets, lawns, and other open areas, especially in between Brook Rd and Hudson Ave, as well as across the river from the town recreation fields.

Finally, there were considerable damages to both public infrastructure and private property. Over a dozen residential properties were impacted, and **the Mill St bridge that goes over the Great Brook was washed away.** Too low to effectively let debris caught in the brook pass through, the bridge eventually became so backed up and was under such immense pressure that it completely broke, requiring a temporary bridge to be built a few days later. (A more permanent replacement will be constructed in the future, elevated higher above the brook than the previous bridge to prevent similar issues.) Miraculously, the shorter bridge on Brook Rd, in between Creamery St and Mill St, did not break despite being almost 100 years old and also getting clogged by debris. Instead, the Great Brook shot over its banks horizontally to circumvent the bridge, eventually flow back into the waterway, and continue on downstream.

Sources: Town of Plainfield, Vermont Public



Center of Plainfield Village, July 12, 2024
Image Source: University of Vermont

VILLAGE BUYOUTS

Due to the extent of the damage in Plainfield Village, a majority of the town's approved FEMA buyouts are concentrated in this area. In total, the village has

14 buyout properties occupying 6.08 acres, which contain

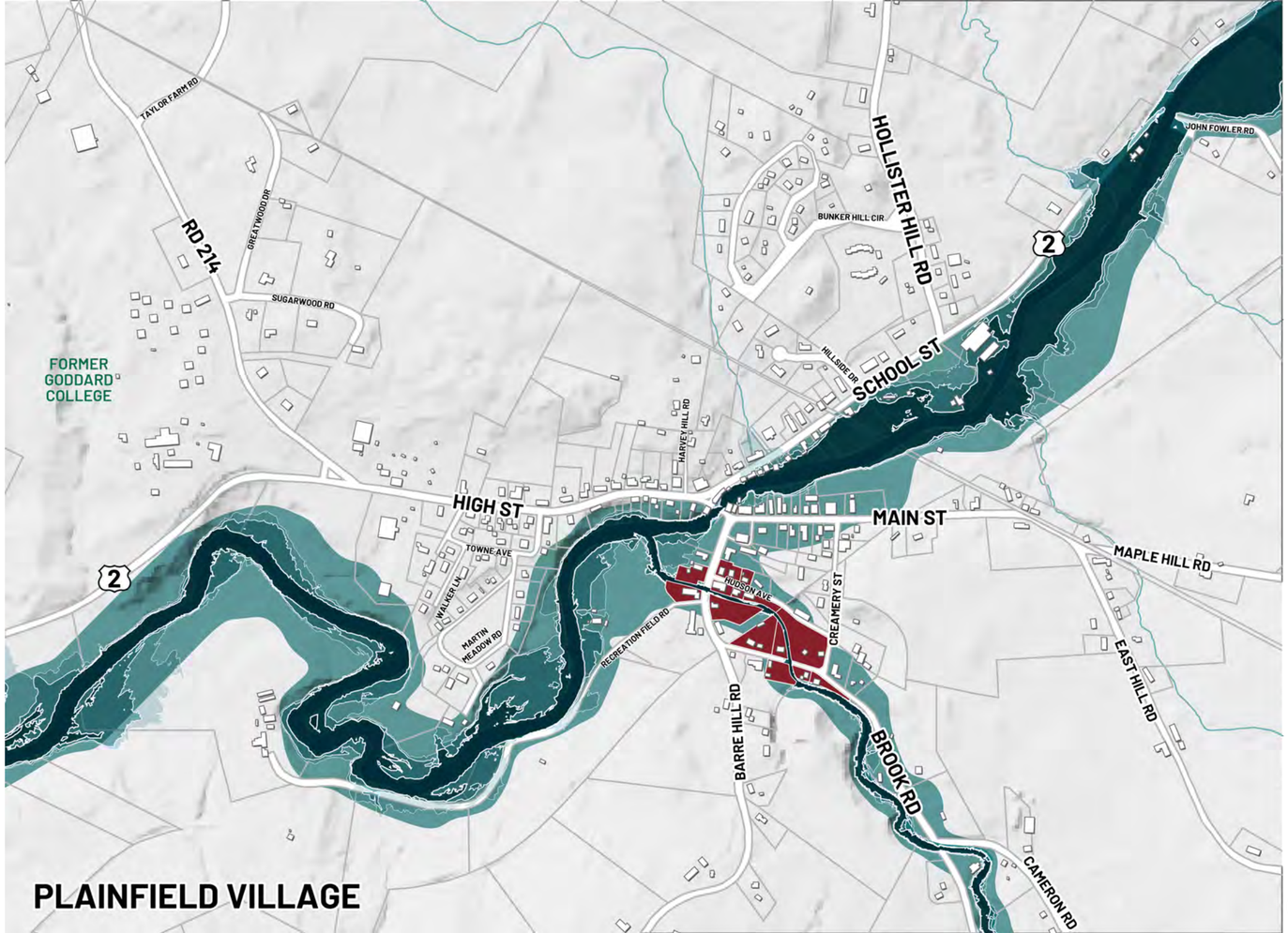
24 residential units, and are valued at

$2,608,800 in property value.

Each one of Plainfield's 25 buyouts represents a significant blow not only to the town's housing stock, considering how few units there are to begin with, but also to the town's budget and its overall financial capacity, which is already very low and heavily reliant on property taxes. However, because of their location right in the heart of the historic village, these 14 buyouts represent an additional blow to the soul of Plainfield. Also, development in the Village Expansion Area and at Goddard could only make things worse in this respect; while these projects could provide much-needed housing, increased tax revenues, and various other benefits, they could simultaneously shift the center of gravity in Plainfield Village away from the historic center, threatening to make this important part of the town irrelevant.

Therefore, **Plainfield should utilize these buyout properties as an opportunity** to celebrate Plainfield's culture, keep the historic center of town alive, and knit the extended village together, all while making Plainfield more resilient against future floods.

Sources: Vermont Parcel Viewer, Town of Plainfield



FEMA BUYOUTS

Source: Vermont Open Geodata, The University of Vermont, Town of Plainfield

- Winooski River
- River Corridor
- Streams

UVM Inundation Model

- 2-Year Flood
- 5 to 25-Year Flood
- 50-500-Year Flood

- Approved FEMA Buyout Sites

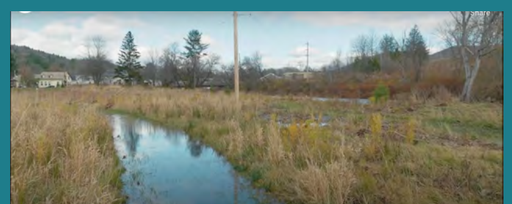
0 500 1,000 Feet

CASE STUDY: DOG RIVER PARK, NORTHFIELD, VT

The town of Northfield, VT, about 20 miles southwest of Plainfield, found itself with four undevelopable acres of land right next to its town center following Hurricane Irene in 2011. The town had approved 18 buyouts in this area due to damages sustained from an overflow of the Dog River, which meanders its way through Northfield much like the Great Brook in Plainfield. WIth the help of Montpelier's National Life Group, teachers and students from local schools, the U.S. Fish and Wildlife Service, and various other entities, as well as funding from a FEMA Hazard Mitigation Grant, these properties were converted into Dog River Park by the town of Northfield and the nonprofit organization Friends of the Winooski River. The park officially opened in 2018, and received a Vermont Public Places Award in 2021.

Dog River Park is divided into three zones. The first zone is farthest from the river and situated along a neighborhood street, containing low-cut grass that allows for general recreation. Getting closer to the river, there is a "meadow" zone with native grasses and wildflowers. These plants are more effective at soaking up water during flood events than normal grass, but there are still trails passing through them that provide additional public space for visitors. Finally, along the water, the floodplain was restored with denser, larger plants like trees and shrubs, whose primary goal is to retain as much water as possible when Dog River overflows.

So far, the park's interventions seem to be making a real impact. Besides becoming a valuable public space for people in Northfield, Friends of the Winooski River estimate that the water level near the park during the 2023 flood was six inches lower than it would have been prior. This considerably limited damages, demonstrating the cost savings produced by floodplain restoration in the long run.



Images and Text Source: Friends of the Winooski River

NAME ORIGIN

The name for this park comes from a local landmark, a stone structure called Chicken It'sa that is located partially within one of the buyout properties. Chicken It'sa – named after the Mayan city of Chichen Itza in present-day Mexico, which contains similar-looking stone pyramids – used to serve as a railway for the trains that would pass through Plainfield, although it now sits unused. In this way, calling this area Chicken It'sa Park not only invokes the rich history of Plainfield, but it also pays homage to the town's playful character.

DESIGNATED ZONES WITHIN CHICKEN IT'SA PARK

Many of the same strategies utilized in Dog River Park are proposed for Chicken It'sa Park. Because so much of the park's land would be located directly along the Great Brook, flood resilience would be the main focus, although some recreational uses would be incorporated as well. In designing the park, **buyout properties were assigned one of two conditions: public space and riparian buffer.** The public space parcels would be designed much in the same way as the "meadow" portion of Dog River Park: mass planting of wildflowers, native grasses, and similar vegetation that is not super thick or tall, but still absorbs lots of water and can be easily traversed by people as part of a trail, making it open to all for that purpose. Meanwhile, the riparian buffer parcels would all be located along the Great Brook, and would receive more significant rewilding and revegetation efforts. Trees, shrubs, and other larger-scale plants would be introduced so that when flooding happens again in Plainfield Village, there is much greater capacity for water retention along the banks of this waterway. Residents would not be encouraged to enter these parcels so as to not disrupt the environment within them.

Image Source: Planning Team

Image Source: Planning Team

CHICKEN IT'SA PARK: CONCEPTUAL DESIGN PLAN

This diagram is a conceptual design for Chicken It'sa Park.

The public space parcels are highlighted in yellow, while the green ones are the riparian buffer areas. The public space was generally concentrated on the north side of the Great Brook so that the trail coming from the Village Expansion Area could be easily routed through the park. Additionally, since Plainfield is looking to remove the bridge on Brook Rd represented by the red X, closing off a small portion of that road and making the parcels on the southern side of the brook only accessible via Mill St. Removing said bridge, which is quite low compared to the height of potential floodwaters, will prevent it from getting clogged by debris like it did in July 2024, allowing water to flow more freely in turn.

After the trail exited the last buyout property along Hudson Ave, it would split in two ways. First, it would go through the site of the former Heartbreak Hotel to provide easy access to the town recreation fields, linking together these two public spaces in the heart of the village. The trail would also turn north and continue along Mill St, transitioning to a different segment of a larger trail network that is discussed in Chapter V.3 of this plan.

Cross Plainfield Trail

Public Space

Riparian Buffer

Removed Bridge

Closed Road Segment

IMPLEMENTATION

In creating this space, the first tasks would be to complete the buyout process for each property, tear down the buildings, and remove the bridge along Brook Rd, which would likely take a number of years. However, while these things are being done, the town can also engage with the community and relevant experts (landscape architects, hydrologists, etc.) to decide on exactly what these public space and riparian buffer parcels should look like. Plainfield can also potentially collaborate on this project with Friends of the Winooski River, considering their success with Northfield in creating Dog River Park, and utilize FEMA Hazard Mitigation Grant funds (if awarded) to pay for the project.

Base Image Source: University of Vermont

V: PUBLIC SPACE IMPROVEMENTS
V.2: BROOK ROAD

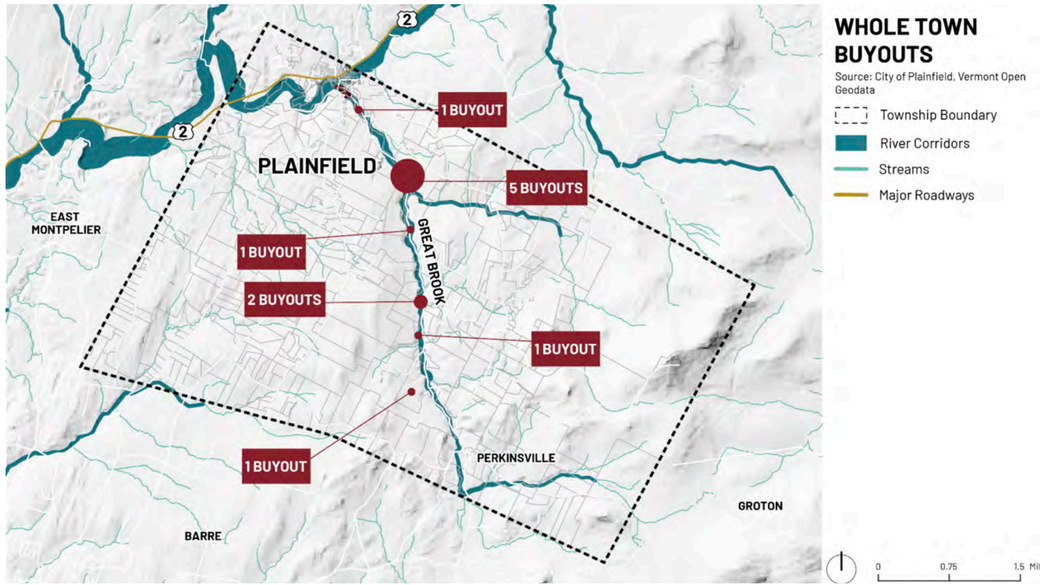
Outside of the village, essentially all of the damage that occurred in Plainfield due to the 2024 flood happened along Brook Rd. To ensure that residents have sufficient transportation options, Plainfield must make some improvements to this road, although serious consideration should be given to how much longer the town wants to keep rebuilding it when it will flood and get damaged again many times in the future.

BUYOUTS OUTSIDE OF THE VILLAGE

Outside of Chicken It'sa Park, Plainfield will still be left with **11 buyout properties totaling 104.09 acres**, all of which are located along Brook Rd. Within these properties, the town can similarly **pursue revegetation and other floodplain management improvements** along the edges of the Great Brook, helping calm flood waters during major storms before they reach the village center. Not only would this hopefully lead to less damages for the remaining properties along the brook and Brook Rd, but it would be especially beneficial for the properties in the relatively low-lying village center, which has to deal with fast-moving water rushing down from higher elevations in outer Plainfield.

Two of these buyout properties are also quite large in area; 2996 Brook Rd and 3316 Brook Rd are 14.6 and 68 acres, respectively. FEMA does allow farming on buyout properties, and considering the size of these parcels, **they could potentially be good opportunities for community garden or community farm spaces**, providing a new amenity for local residents while playing into the agricultural history of Plainfield.

Source: Vermont Parcel Viewer, FEMA

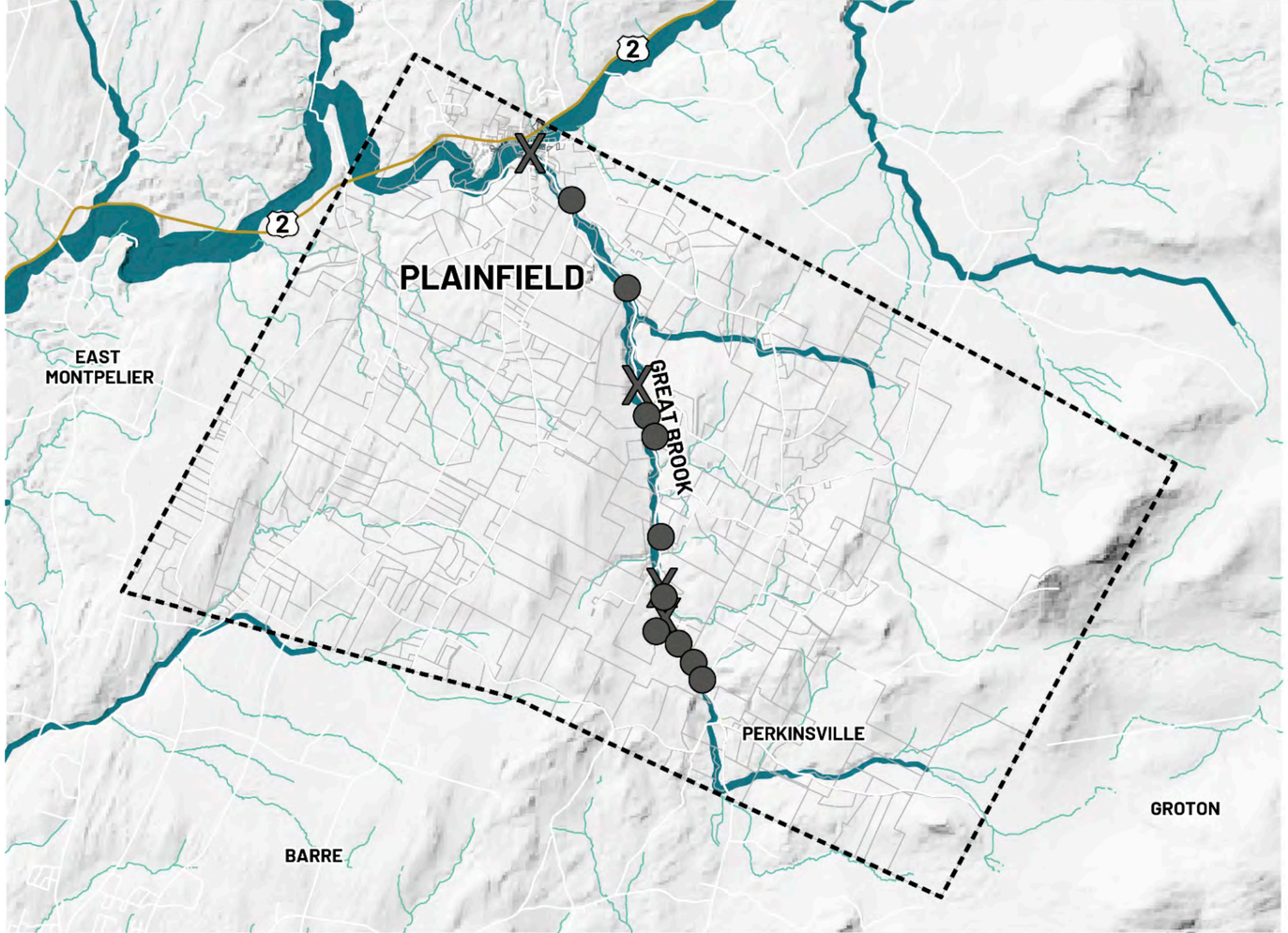


DAMAGES TO BROOK RD

To examine the damage done specifically to Brook Rd by this flooding event, our group utilized UVM drone footage taken the day after and inspected the road along its entire length. In doing so, two major categories of damages became clear: destroyed bridges, and portions of the road that had been partially or completely washed out by the flood waters. This map highlights the findings: **four destroyed bridges and 10 wash outs of varying degrees**. According to the town, **repairing all of these damages could cost somewhere between $10-15 million**, which is an incredibly high number for a town like Plainfield that has such limited financial capabilities. Even if this project was awarded the FEMA Hazard Mitigation grant that Plainfield applied for, which would provide the majority of funding required for this project, covering the remaining amount would still be very difficult, especially considering the number of towns throughout Vermont that are suffering from the same issues and are asking for money from the same sources.

With this in mind, the "necessity" of repairing each one of these damages was assessed to see whether or not Plainfield could potentially save some money by being selective in what it chooses to repair. This was also done for two additional reasons. First, the eleven buyouts that have been approved along Brook Rd will reduce the amount of people who live on the road and depend on it daily for transportation purposes, rendering it less vital for the town's overall road network. Secondly, as our group learned from conversations with Plainfield residents, Brook Rd has been inundated and damaged by flood waters various times in the past, which makes sense considering how closely it follows the Great Brook throughout town. With the threat of flooding only growing greater in Plainfield and all of Vermont due to climate change, this road will also continue to flood again and again over the years, and constantly spending millions of dollars to repair it after each flooding event would represent a significant waste of both time and money.

Sources: Town of Plainfield, University of Vermont

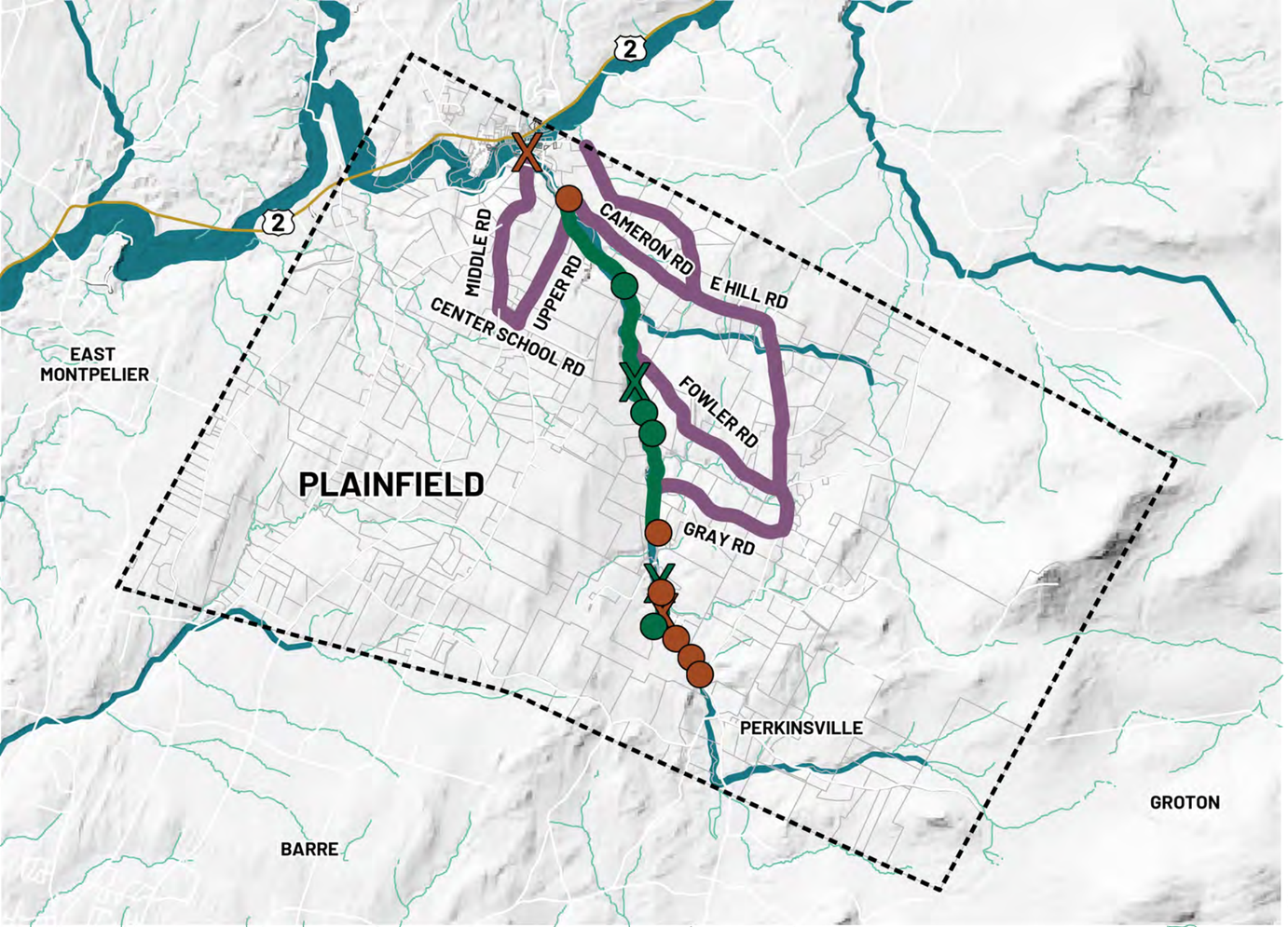


BROOK RD DAMAGES

Source: City of Plainfield, The University of Vermont, Vermont Open Geodata

- Township Boundary
- River Corridors
- Streams
- Major Roadways
- Washed Out Road
- Destroyed Bridge

0 0.75 1.5 Miles



BROOK RD REPAIRS AND CHANGES

Source: City of Plainfield, The University of Vermont, Vermont Open Geodata

- Township Boundary
- River Corridors
- Streams
- Major Roadways
- Washed Out Road - Non-essential Repair
- Destroyed Bridge - Non-essential Repair
- Washed Out Road - Essential Repair
- Destroyed Bridge - Essential Repair
- Cut-Off Road Sections
- Existing Roads to Exit Brook Rd

0 0.75 1.5 Miles

SELECTIVE REPAIRS

Therefore, the damages were split up into two categories: essential and non-essential repairs.

Essential repairs are bridges and washed out segments of road that need to be fixed so that those who still live on Brook Rd are able to leave their homes and travel to wherever they would like in their cars.

Non-essential repairs, meanwhile, could potentially be skipped over in the reconstruction phase. Considering the location of buyouts and remaining households, these damaged areas would not need to be repaired. This would "close" Brook Rd to some degree, as one would not be able to drive the whole length of the road through town like they could prior to July 2024. However, all of the residents living along the green portion of Brook Rd indicated on the map to the left would still be able to drive out of their driveways, utilize an intact portion of the road to get to a purple street, and then use that purple street to then travel to Plainfield Village, a different part of town, or wherever else they would like to go.

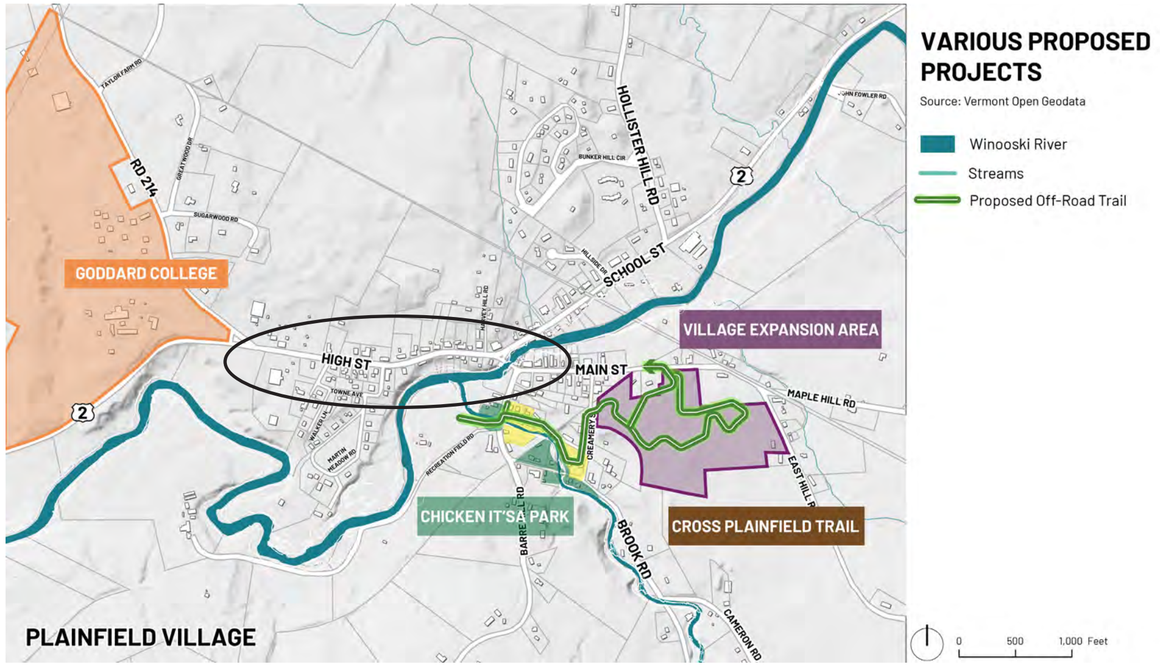
It should be noted that this would not be a permanent solution. In a vacuum, the ideal outcome would be to fully abandon Brook Rd, with E Hill Rd or Middle Rd taking on more of the vehicles looking to travel through Plainfield to and from the village. While this is not immediately possible due to the residents that are still living along it, we encourage the town to work with those property owners in the near future to see if they would potentially be open to selling or disposing of said properties in some other way, making it so that Plainfield would no longer have to keep fixing this road that will just be damaged again in the future.

V: PUBLIC SPACE IMPROVEMENTS
V.3: CROSS PLAINFIELD TRAIL

The Cross Plainfield Trail will primarily serve as a pedestrian path for local residents, improving walkability while uniting different segments of the village and heightening Plainfield's small-town feel.

A NEED FOR COMPLETE CONNECTION

While Chicken It'sa Park would be connected to the Village Expansion Area via the proposed trail running through both sites, all of this proposed development within Plainfield, especially at Goddard, could still cause the village to feel physically disjointed and harm residents' ability to foster connections. Therefore, more attention must be paid to ways in which the new Plainfield Village can be brought together into a cohesive whole, both physically and metaphorically. One option is to build out additional segments of trail in the circled part of the graph below, creating a continuous pedestrian path throughout the village known as the Cross Plainfield Trail.



CURRENT RT-2 CONDITIONS

The most logical route for a trail segment connecting Chicken It'sa Park and Goddard College would follow three local roads: Mill St, Main St, and High St, the latter of which is also known as RT-2. Over the short distances that trail users would be on Mill St and Main St, two relatively quiet roads, there are continuous sidewalks and a decent amount of greenery (mostly along Mill St) that make the pedestrian experience feel relatively safe and comfortable.

However, trail users would likely feel much less safe and comfortable when walking along High St considering the current conditions. The road feels quite tight for pedestrians due to the **narrow five-foot sidewalks on just one side of the road, the three-foot shoulders with no additional buffer between vehicles and pedestrians**, and the small front yards of many properties. This is a much bigger issue on High St compared to what it might be on Mill St, for example, because High St is a state road with significantly higher daily traffic volumes than most other roads in Plainfield. Additionally, despite most of Plainfield being so well preserved, there are no street trees, rain gardens, or any sort of greenery along this stretch of road (outside of the grass on people's lawns) to help cool pedestrians down in the heat, make them feel better protected from the cars on the road, and reduce stormwater runoff.

Additionally, after walking about a quarter mile west along High St from its intersection with Main St, pedestrians are instructed to cross the road to reach a bus stop and the town post office, as indicated by the pedestrian crossing signs located on both sides of the road. However, besides there being no dedicated crosswalk for people to use, crossing the road is also necessary here because the sidewalk abruptly ends. It does not continue on the opposite side of the road either, so while one is able to access important town buildings, they are similarly **unable to continue the remaining quarter mile up to Goddard's campus on foot.**

All of these issues necessitate improvements to High St that will seek to improve pedestrian safety, enhance the overall pedestrian experience, and fill in the remaining portion of the Cross Plainfield Trail, making Plainfield Village a much more walkable place.

High St in Plainfield Vilalge, west of Town Hall and east of the library
Image Source: Google Maps

High St across from the Plainfield post office
Image Source: Planning Team

Street section of current High St configuration

PROPOSED IMPROVEMENTS

Four specific improvements should be pursued along High St: an extension of the sidewalk up to Goddard College, wider sidewalks, street trees and other greenery, and multiple marked crosswalks with corresponding signals.

A portion of Main St in Plainfield Village with street trees and other greenery
Image Source: Google Maps

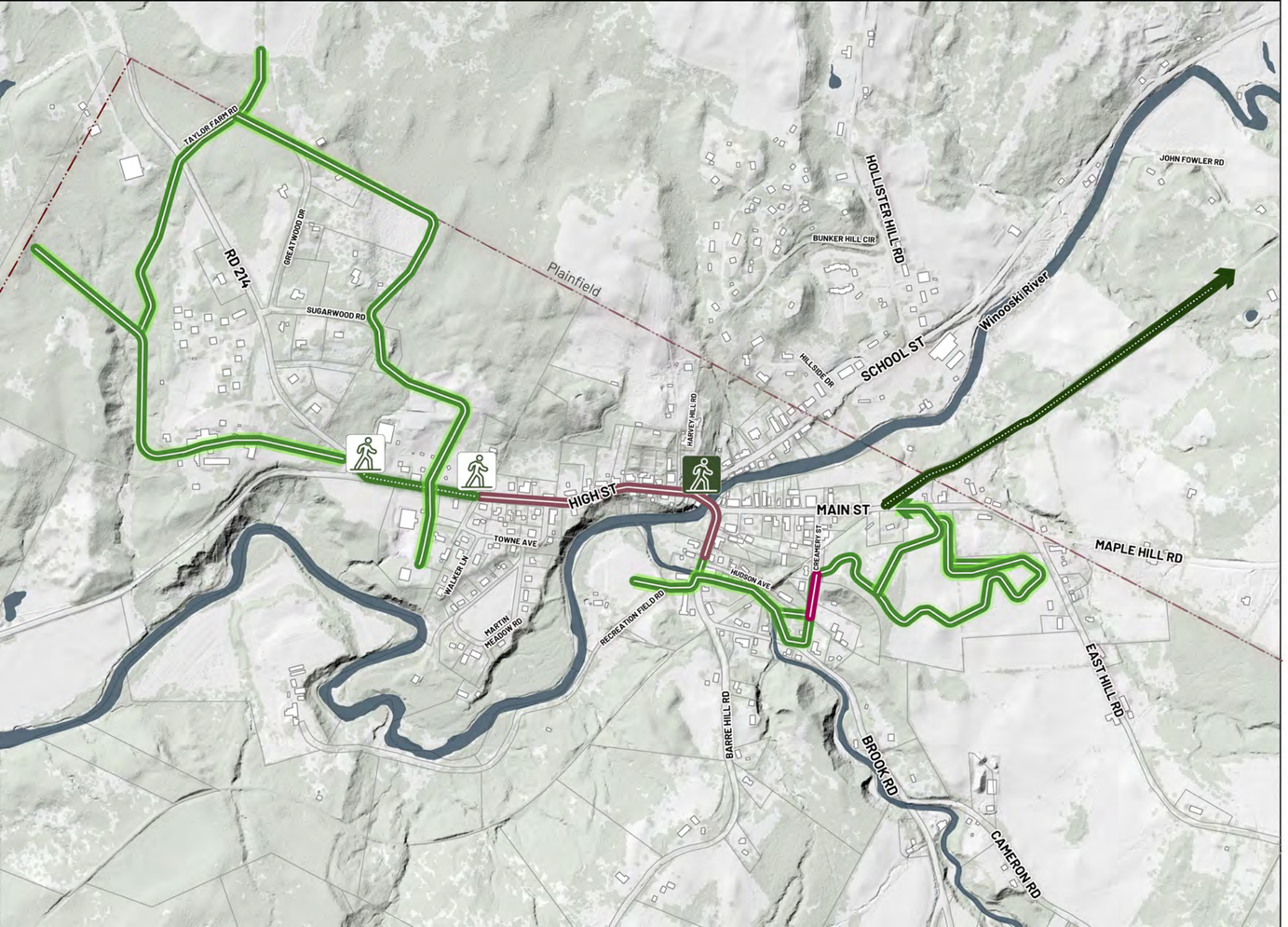
Goddard Sidewalk Extension: For Goddard to truly feel like a part of Plainfield Village, and to make it easier for Plainfield residents – including those who may be living on the site in the future – to walk the relatively short distance between the campus and the rest of the village, the sidewalk should be extended from where it currently ends to the intersection of High St and RT-214, where it should continue up the latter to the main campus entrance along Pitkin Ave. The south side of the road would be ideal for the new sidewalk segment along High St, as this would still allow for access to the post office while encroaching less on a private property found on the north side.

Wider Sidewalks: While it might look as though the properties along High St start where the current sidewalk ends, utilizing data from the Vermont Right of Way Atlas, the right of way for this road that is owned by the state generally extends about three feet past the sidewalk, suggesting the potential for widening. Just those three extra feet would make a significant difference for pedestrians walking along this road, as it would allow them to increase the distance between themselves and the cars on the road; create more room for people to pass one another or walk side-by-side, especially if someone is using a wheelchair or other mobility device; and create more space for the inclusion of things like street trees in the sidewalk.

An example of a crosswalk with rectangular rapid flashing beacons
Image Source: U.S. Department of Transportation

Street trees and other greenery: Utilizing the extra sidewalk space, street trees, rain gardens, and other greenery should be planted along High St at regular intervals. These improvements would similarly act as a buffer between cars and people, provide shade and other cooling impacts in the summer months, improve the aesthetics of this road, and contribute to flood resilience.

Marked Crosswalks: Two new crosswalks are needed close to Goddard: one where pedestrians are currently supposed to cross to get from the north side of the road to the south by the post office, and one at the RT-214 intersection to get people back on the north side so they can safely walk up to Goddard. To maximize pedestrian safety, standard crosswalk stripes should be painted at each location. Pedestrian crossing signs should also be outfitted with rectangular rapid flashing beacons, which emit flashing yellow lights to signal that cars must slow down and yield to pedestrians. These signals are touch-activated, meaning that when no one would need to use these intersections, traffic along High St could continue as normal, helping maintain efficiency along this busy road while still making it more walkable for residents.



CROSS PLAINFIELD TRAIL

- Winooski River
- Proposed Off-Road Trail
- Existing Sidewalk
- Proposed New Sidewalk
- On-Street Segment
- Cross Vermont Trail
- Planned Intersection Redesign
- Proposed Crosswalk with Actuated Traffic Light or RRFBs

ONE UNIFIED TRAIL

From end to end, the Cross Plainfield Trail would be approximately **19,614 feet, or 3.71 miles** long:

4,224 ft in the Village Expansion Area
528 ft along Creamery St
1,206 ft throughout Chicken It'sa Park
2,200 ft along existing sidewalk
1,556 ft along new sidewalk
9,900 ft within Goddard's campus and adjacent parcels

This project would take advantage of the **Cross Vermont Trail (CVT)**, which spans the entire width of the state. Although the trail currently has both on-road and off-road sections, the Cross Vermont Trail Association (CVTA) recently completed construction of a bridge in Montpelier in line with its goal of eventually bringing the whole trail off-road. It is also building off-road segments in East Montpelier, signifying that Plainfield is soon to be a focus as the organization moves east, and highlighting an opportunity to integrate these two trails together into a larger network. CVTA already has an off-road trail segment in town that starts at the Park and Ride along Main St and follows an old rail bed to John Fowler Rd, which the proposed Village Expansion Area trail segment would connect with, and future CVT development in other areas would only open up more possibilities. Integration between these two trails would make it easier for local residents to access the CVT, and potentially bring more visitors to Plainfield Village from the CVT.

BUILDING THE CROSS PLAINFIELD TRAIL

Stage 1 - Sidewalk Improvements and Extension on High St: Since the new owner of Goddard can begin work on the property whenever he would like, and working with the state on improvements to a state road will likely be a lengthy process in itself, Plainfield should first begin work on the widening of the sidewalk and planting greenery along High St; extending the sidewalk up to Goddard; and building new crosswalks at the proposed locations. Working first on this part of the trail would also capitalize on the upcoming reconfiguration of the intersection between Main St and High St, which, according to a local resident, has already been approved.

Stage 2 - Village Expansion Area / Creamery St Segment: With the town hoping to start development in the Village Expansion Area in 2026, creating this portion of the trail is not the first priority, but it should begin relatively early in the process. Doing this in tandem with initial housing development would also help ensure that these segments would be open when the first residents move into their homes, making sure that they immediately have easy pedestrian access to both the Cross Vermont Trail and the rest of Plainfield Village.

Stage 3 - Chicken It'sa Park Segment: Going through the entire FEMA buyout process will take a long time for the 14 properties in the future Chicken It'sa Park. Because of this longer timeline, building out this portion of the trail would likely be pursued later on in the process.

Stage 4 - Goddard College / Western Off-Road Segment: Because the town has no direct control over what will be done at Goddard, and the remaining trails in this area are proposed through private property maintained by the Vermont Land Trust, this segment should be the lowest priority for Plainfield. This does not make it less integral to the trail, but focusing first on segments where the town owns the land and has more control could provide quick wins for the project that help it maintain momentum and garner more support.

Community Engagement: Local residents should be brought into the whole planning process when each one of these trail segments is being developed, from design to implementation. Public comment can help ensure that trails will not be routed in places that will overwhelmingly disturb neighboring property owners; that they will be physically built according to the needs of the community, especially Plainfield's older residents; and that signage will include useful information, but is also designed in a way that plays into Plainfield's culture. Local artists can even help with designing and building signs to be placed along the path, giving it a unique and authentic character.

CASE STUDY: FREEDOM TRAIL, BOSTON, MA

The Freedom Trail in Boston, MA provides a great example of how the town can make the Cross Plainfield Trail more than just a collection of a few trails and sidewalks, but a special amenity for residents that facilitates a comfortable walk through the village, all while feeling like Plainfield. Like the Cross Plainfield Trail, the Freedom Trail – which connects many of Boston's most iconic landmarks along one walking path – is predominantly located on normal city sidewalks. However, what makes the trail unique and different from a normal sidewalk is the use of historical markers, special patterns of brick in the sidewalk, and other forms of branding that teach its users about the buildings and other landmarks they are passing. Although the Freedom Trail is intended more for tourists visiting Boston rather than everyday residents, these branding tactics can be utilized by Plainfield nonetheless.

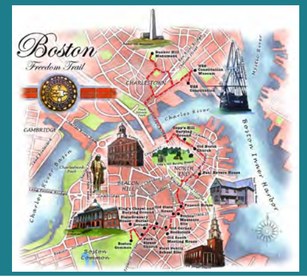


Image Sources: One Road at a Time, Wikipedia, Freedom Trail

Planning for Resilience in Plainfield

VI: THE FUTURE OF PLAINFIELD

University of Pennsylvania Climate Resiliency Studio

PROJECTING PLAINFIELD'S FUTURE

POTENTIAL NEW HOUSING UNITS

GODDARD COLLEGE

Creative Zone

- Transitional Housing or Senior Housing could provide 18 - 36 units of alternative housing

Residential Zone

- Phase 1 conversions could provide 80 - 130 units units
- Phase 2 conversions could provide 10 - 20 units

VILLAGE EXPANSION AREA

- Development could provide 47 - 94+ units

Both developments could provide **155 to 280+ new residential units to Plainfield.**

Image Source: Ecovillage Ithaca

POTENTIAL NEW TRAILS

CROSS PLAINFIELD TRAIL

- **9,900 ft** within Goddard's campus and its adjacent parcels
- **4,224 ft** within the Village Expansion Area
- **528 ft** along Creamery St
- **1,206 ft** through Chicken It'sa Park
- **1,556 ft** of new sidewalk

In total, the **Cross Plainfield Trail** would provide Plainfield with **over 19,614 ft or 3.71 miles of additional trails.**

Image Source: Ecovillage Ithaca

POTENTIAL GREEN SPACE ADDITION

CHICKEN IT'SA PARK

- FEMA buyout conversion could provide 6.08 acres of land for recreational and flood mitigation
- Buyouts beyond the village boundaries will provide 104 acres of green space to the town

VILLAGE EXPANSION AREA

- The Village Expansion plan will provide 12.13 acres of green and open space

In total, Plainfield could have **over 122.21 acres of green space**.

Image Source: Politico Urban Initative

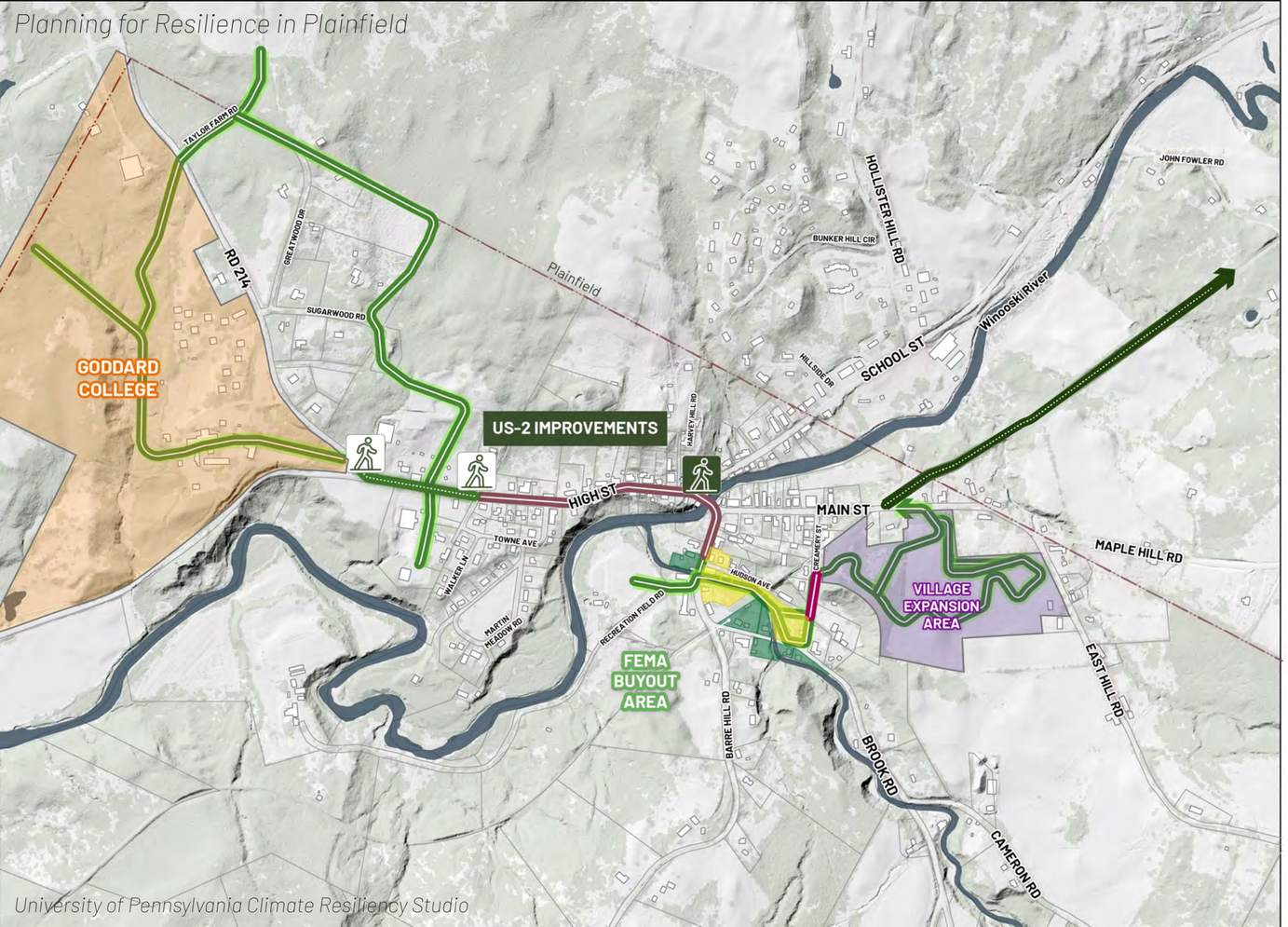
POTENTIAL ARTS SPACE

GODDARD COLLEGE

- Creative Zone conversions could provide over 4 community and artistic uses
- Art spaces in Goddard can be used to host 1 - 10 art residences at a time

In total, Plainfield could have over **4 different community and artistic uses** in Goddard College, providing collaborative **work spaces for 1 to 10 artists**.

Image Source: Goddard College Instagram



THE FUTURE OF PLAINFIELD

Source: Vermont Open Geodata

- Winooski River
- Streams

BUILDING A RESILIENT AND CONNECTED PLAINFILED

Plainfield stands at a pivotal moment as it faces the challenges of climate change and urban development. The 2024 floods exposed the town's vulnerabilities but also revealed an extraordinary opportunity to rebuild with purpose. By embracing strategic flood recovery and buyout initiatives, Plainfield can turn adversity into a foundation for resilience. Reimagining buyout properties as community assets, like the proposed Chicken It's a Park, will not only mitigate future flood risks but also celebrate the town's cultural heritage and strengthen community bonds.

The redevelopment of Goddard College and the Village Expansion Area represents a bold vision for resilience, inclusivity, and sustainability. These projects address immediate recovery needs while positioning Plainfield as a leader among small towns tackling similar challenges, setting a standard for innovative, community-driven development.

Reevaluating Brook Rd with a focus on essential repairs and creative land use can reduce financial strain and open opportunities for innovation, such as community agriculture and expanded riparian buffers. These actions honor Plainfield's agricultural heritage while addressing critical flood mitigation needs. Additionally, the proposed Cross Plainfield Trail and improved pedestrian infrastructure promise to enhance connectivity, linking key areas like the Village Expansion Area and Goddard College through safe, inviting pathways.

Equally vital is fostering meaningful community engagement. A community-driven approach ensures that Plainfield's residents actively shape their town's future, fostering ownership and accountability. Workshops, forums, and participatory decision-making can effectively merge technical expertise with local insights, ensuring solutions are both practical and embraced.

This is more than a recovery plan—it is a visionary blueprint for a stronger, more connected Plainfield. These initiatives will protect the town from future disasters while laying the foundation for a vibrant, sustainable future that enhances residents' well-being and economic stability. The time to act is now. By implementing these recommendations, stakeholders can transform Plainfield into a model of resilience and innovation for generations to come.

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MONTPELIER STRATEGIC PLAN: A VISION FOR GROWTH, PRESERVATION, AND RESILIENCE

CPLN 7010 Climate Resiliency Studio | Fall 2024

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Acknowledgements

Our team would like to thank everyone in Barre, Montpelier, Plainfield, the University of Vermont, and beyond for your insight and support throughout this project. Your hard work and care to make Vermont resilient is admirable. We would also like to thank our instructors, Scott Page and Jaime Granger. Thank you for your unwavering dedication, expertise, and encouragement throughout the semester—we could not have done it without you!

PLEASE NOTE: This report serves as an academic exercise for our CPLN 7010 Studio class and should not be regarded as an actual strategic plan. It is based on a semester's worth of qualitative and quantitative research, but lacks community engagement, which is not feasible within the constraints of this course. The analysis and recommendations herein reflect only the interpretations of this studio group and should not be considered representative of the views or desires of the Montpelier community.

MONTPELIER STRATEGIC PLAN: A VISION FOR GROWTH, PRESERVATION, AND RESILIENCE

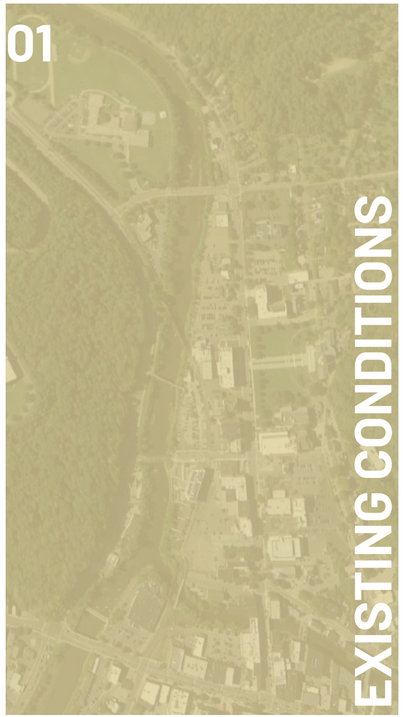
ABOUT THE STRATEGIC PLAN

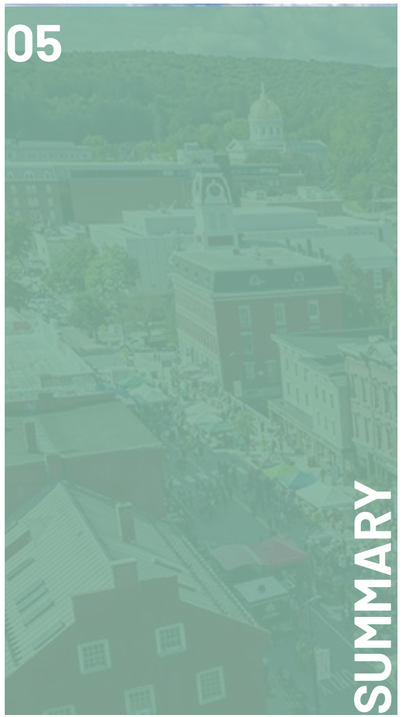
Montpelier, the capital of Vermont, lies in the heart of the state within Washington County. The city is surrounded by water at the confluence of the Winooski River, Pond Brook, Stevens Branch, and the North Branch. It is also situated at the foothills of the Green Mountains. This unique geographic setting makes Montpelier highly vulnerable to riverine flooding—a pressing challenge not only for the city but for the entire state of Vermont.

Vermont has had a long history of flooding. In fact, over the past two centuries, Vermont has endured over 20 major flooding events, nearly 12 of which occurred in the last 50 years. Among these, the Great Vermont Flood of 1927 remains the most catastrophic, leaving a lasting mark on Vermont's history. Montpelier itself has experienced five significant floods between 1927 and 2024, including one of the most severe events in 2023. That year, the Winooski River reached a gauge height of 21 feet, inundating the downtown area, forcing the rescue of hundreds of residents, and causing over $200 million in damages. With climate change intensifying, research warns that such flood events are likely to become even more frequent and severe.

Understanding the existing conditions, issues, and opportunities that have come to characterize Montpelier, we propose a high-level strategic plan to help the capital and its residents to adapt, coexist, and thrive with water. This plan prioritizes proactive downstream efforts that address flood mitigation and historic preservation while also recognizing the growing demands for housing and recreation. The intention of our work is to ensure that Montpelier remains a resilient, vibrant, and sustainable place to live, work, and visit—now and for generations to come.

TABLE OF CONTENTS

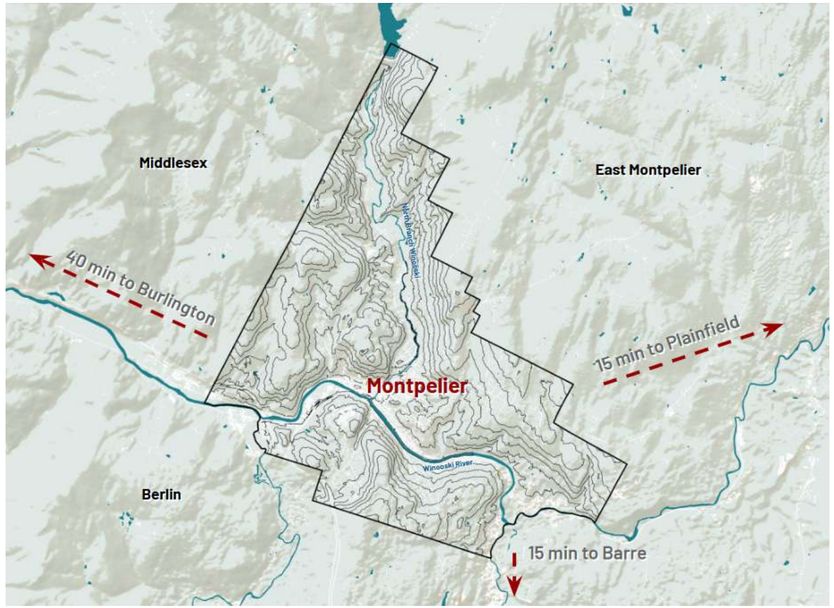




01

EXISTING CONDITIONS

TABLE OF CONTENTS



Geographical Context of Montpelier

Data Source:
Vermont Open Geodata Portal

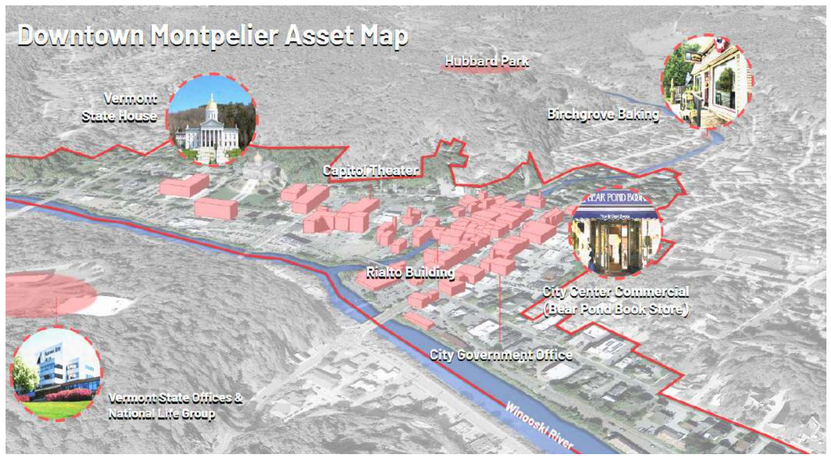
- Undeveloped Land
- 20 ft Contours
- Buildings
- Water Bodies

Location & Boundaries

Montpelier is located in Washington County at the confluence of the Winooski River, Pond Brook, Stevens Branch, and the North Branch which all drains into Lake Champlain. It is neighbored by Middlesex to the north, Berlin to the south, East Montpelier to the east, and Moretown to the west. It is also just a 15 minute drive from both Plainfield and Barre and a 40 minute drive from Burlington. Its close proximity to water and location at the bottom of the foothills of the Green Mountains has led to severe riverine flooding–a significant issue for the city and state, and the central focus of our research.

Montpelier Is Rich With Local Assets

Downtown Montpelier is defined by its historic architecture, government offices, and a vibrant array of locally owned shops and businesses. This strong local character is something Montpelier takes pride in and that residents and visitors alike have come to cherish for its unique charm and community-oriented feel. The map below denotes the designated downtownn in red and highlights a few of Montpelier's many assets.




Montpelier State House


City Center Shopping Mall


Winooski River looking towards Langdon Street


Montpelier Public Works

MONTPELIER AT A GLANCE

Demographic

8,488
Population
Down from peak of 10,922 in 1950

23.4%
Aging Population
Higher than state and county average

11.03%
Racial Minority
DIverse population composition

Socioeconomic

11.55%
Poverty Rate
Lower than state and county average

24th
Social Vulnerability Ranking
Lower than state and county average

64.2%
Bachelor's Degree
Higher than state and county average

Housing

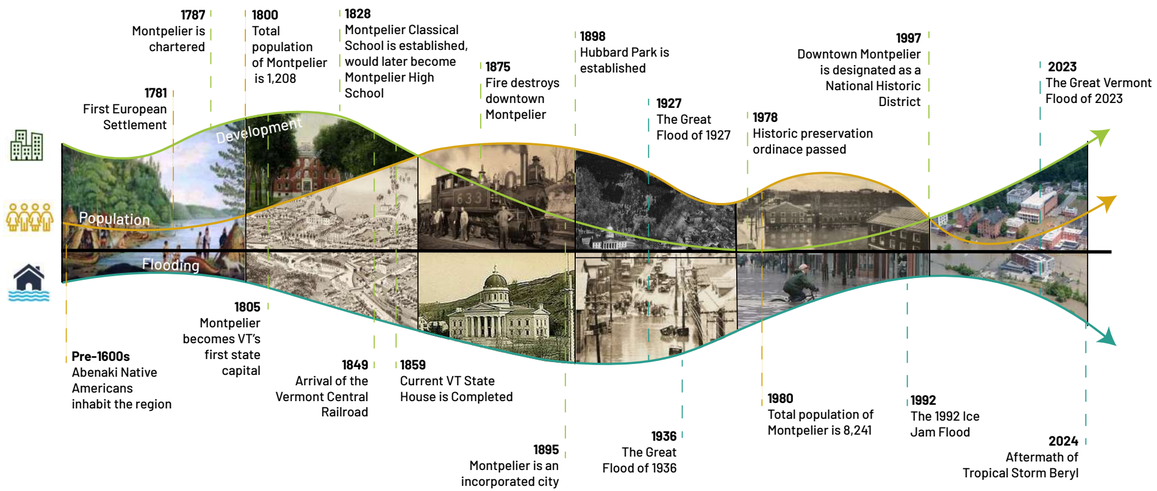
45%
Houses Built 1939 or Earlier
Lower than state and county average

0.9%
Owner Housing Vacancy
5% - 8% is a healthy rate

$71,163
Median Household Income
Barre City: $44,298, Plainfield: $47,500

Montpelier is a Vibrant Town With A Strong Sense of Community and Economic Stability

Montpelier, the smallest U.S. state capital by population with 8,488 residents in 2022, has an aging population that exceeds state and county averages. Over 60% of residents hold a bachelor's degree or higher, and the city boasts one of Vermont's highest median household incomes ($71,163) and lowest poverty rates (11.55%). Despite economic stability, Montpelier faces a significant housing shortage and an aging housing stock, with a vacancy rate of just 0.9% and nearly 45% of homes built before 1940. These trends reflect a community deeply attached to its unique character and stability, with opportunities to grow and become more resilient in addressing future challenges.



A Brief History of Montpelier

Montpelier's history is deeply rooted in its geography and its role as the heart of Vermont. Originally home to the Abenaki Native American tribe, the region was rich in natural resources, with the Winooski River serving as a vital source of sustenance and transportation. European settlers arrived in the late 18th century, with Colonel Jacob Davis establishing the first settlement in 1787. Davis named the town "Montpelier" after Montpellier, France, as a nod to the French support during the American Revolution. After Vermont became the 14th state of the United States in 1791, Montpelier was named the state capital in 1805.

Over time, Montpelier grew into a vibrant political and cultural hub, with the construction of the first Vermont State House in 1836 marking a defining moment in the city's development. The arrival of the Central Vermont Railroad in 1849 connected Montpelier to regional markets, fueling economic growth and solidifying its importance as the state capital. In 1859, the Vermont State House we know today was completed, showcasing a Greek Revival design that has since become an iconic symbol of the city. Montpelier also saw steady growth in its downtown during the late 19th and early 20th centuries, becoming a center for commerce, governance, and community life. By 1997, Montpelier's downtown was recognized for its historical significance and designated a National Historic District. These milestones collectively highlight Montpelier's evolution, blending its rich heritage with the challenges and opportunities of modern urban life.

That all said, it is also important to note that since 1927, flooding has remained a defining feature of Montpelier's history and identity.

A Brief History of Flooding in Montpelier

In 2023, Montpelier experienced over 12.06 inches of rainfall over the course of two days, causing the Winooski River to crest at 21.29 feet and flood the entire downtown area. This 1-in-100-year storm had a profound impact on the city and its surrounding communities, however, this was not the capital's first flood. In fact, since the earliest recorded floods, dating back to before 1787, flooding has played a pivotal role in shaping Montpelier's history and identity.

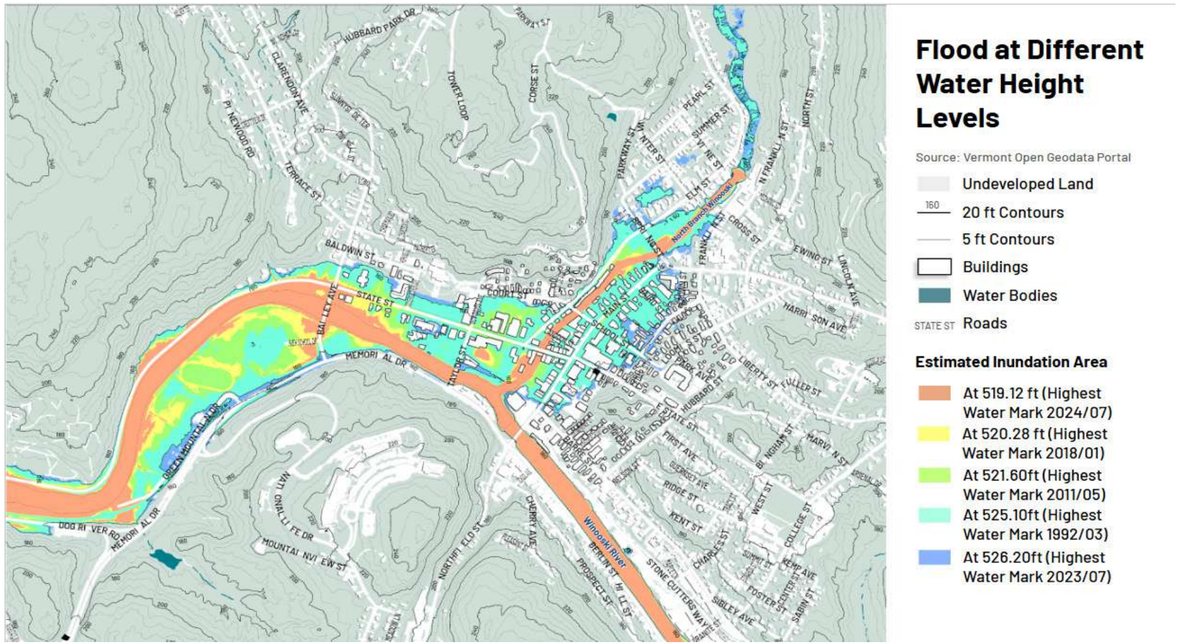
The timeline does not capture every flood that has occurred since the late 1700s, but it does highlight some of the most significant events ever recorded in Montpelier. Severe flood events are happening with increasing frequency and intensity, largely due to climate change. For instance, storms with a recurrence interval of 1-in-100 years have occurred less than 100 years apart–that being the Great Vermont Flood of 1927 anf the Great Vermong Flood of 2023. Additionally, the 2024 flood, triggered by Tropical Storm Beryl, was classified as a 1-in-1,000-year storm, demonstrating the growing severity of extreme weather events facing Montpelier.

Research further indicates that in Washington County, storms once considered 1-in-100-year events are now likely to occur approximately every 63 years. Unfortunately, these extreme events are expected to intensify as climate change accelerates, underscoring the urgent need for Montpelier to implement proactive measures. These interventions are crucial to not only strengthen the city's resilience to future flooding but also to ensure its continued ability to adapt, thrive, and protect its infrastructure, historic character, and residents in the face of increasingly frequent and severe weather events.

02

ISSUES + OPPORTUNITIES

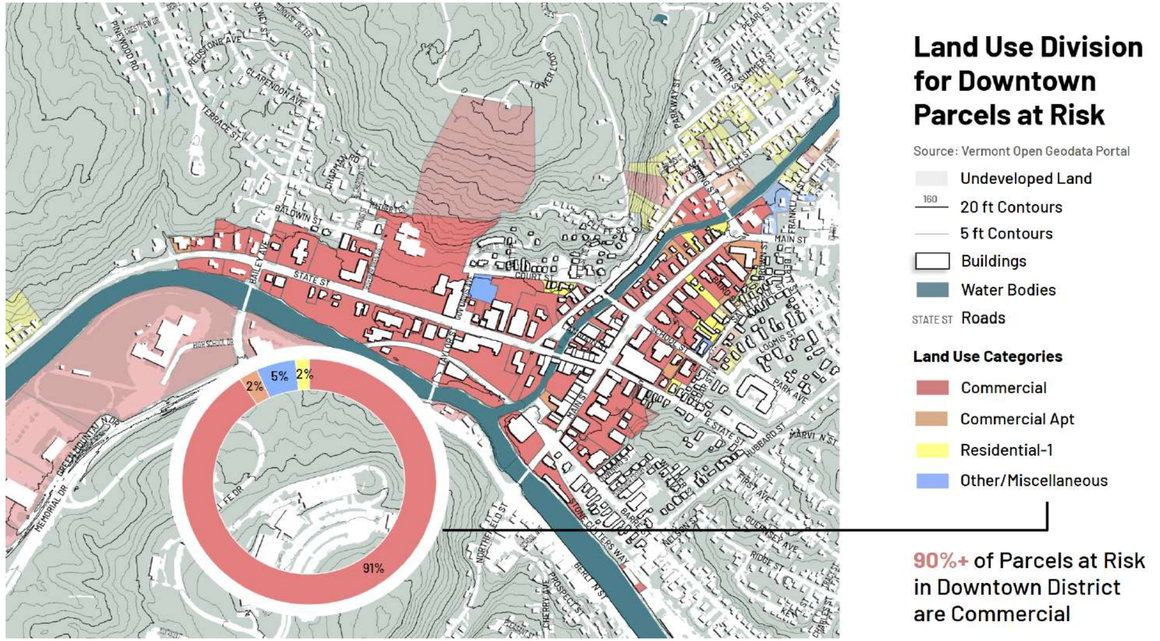
TABLE OF CONTENTS



FLOODING

As has been mentioned in the book so far, flooding is the number one major issue for Montpelier, as well as for the rest of the state of Vermont.

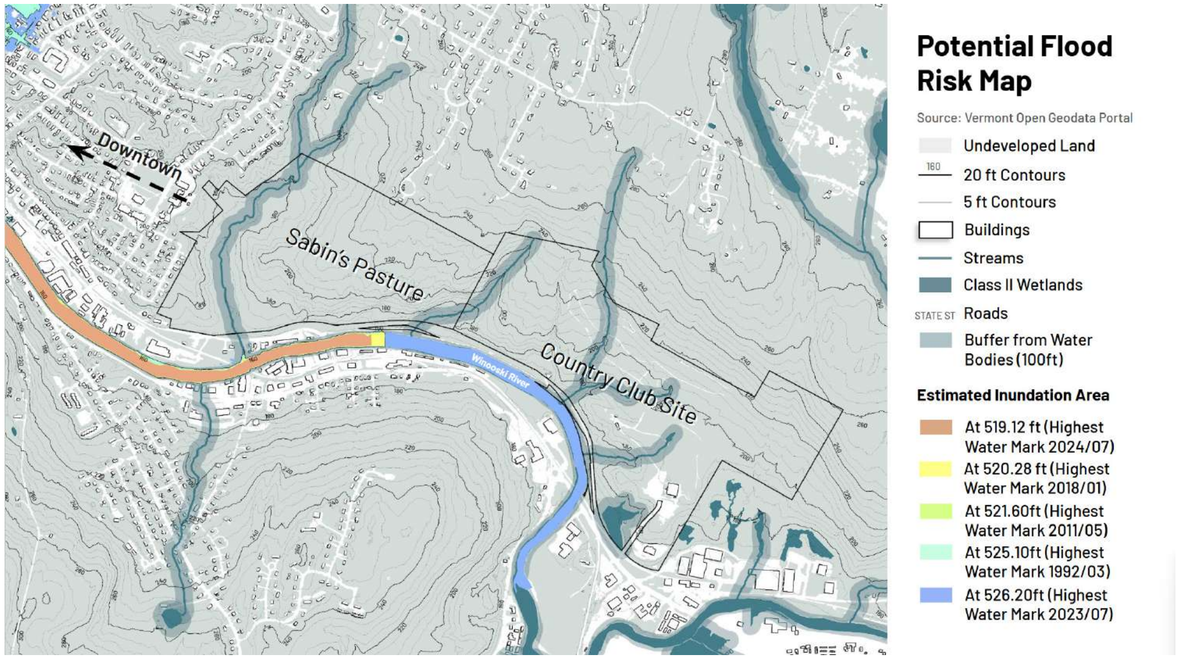
To visualize what these flood events meant for downtown montpelier, we mapped out the inundation area, based on elevation and highest water marks from five recent major flood events. According to the calculation, nearly 60% of the designated downtown area is under the threat if a flood similar to the 2023 were to occur again.



PARCELS AT RISK OF INUNDATION

Further, this map visualizes parcels under flood risk. As we can see, most of the inundated parcels are concentrated in the downtown Montpelier area, with more than 90% of parcels being commercial parcels.

As a note for both maps, FEMA maps provide an important reference for identifying buildings at flood risk or eligible for certain policies. However, we aim to use real flood data to highlight the extent and impact of major floods in Montpelier's history. That said, the data used to make our maps largely comes from Vermont's Open Geodata Portal.



FLOODING IS NOT EXPERIENCED EVENLY ACROSS MONTPELIER

The effect of flooding is not felt evenly throughout the capital region. To the east of downtown, where Sabin's Pasture and the old country club are located, the higher elevation provides natural resistance to floodwaters. These two sites are sites in Montpelier that have been considered for potential development over nearly 20 yrs, but relative plans are still in discussion, as these site are facing some unique development challenges which we will address later in the book.

Why Continue Working in Montpelier?

Building on everything discussed, it is essential to underscore the rationale behind our decision to focus on downtown Montpelier and to advocate for sustained efforts in this pivotal area. Through our analysis of the city's unique circumstances, we have identified a series of significant opportunities and pressing challenges that we believe are both relevant and critical to address for its continued growth and resilience.

OPPORTUNITIES

Montpelier, as a state capital, attracts many people for work and tourism

Vibrant downtown with locally-owned shops and restaurants, fostering a unique community identity

Strong historical character and local pride

Potential for floodproofing and preservation alongside new development

ISSUES

Flood-prone town

Limited public green spaces in the downtown

Housing shortage

Aging housing stock and non-residential infrastructure that is not able to withstand recurrent floods

Why Continue Working in Montpelier?

Additionally, we believe that work should continue in Montpelier because the capital faces unique challenges and opportunies that have far-reaching implications. Relocation is not a viable solution for many residents and businesses due to financial and logistical burdens, as well as the deep cultural ties that bind the community to this historic area. Economically, Montpelier serves as a hub for local commerce and state government, making its revitalization critical not only for its residents but for Vermont as a whole. Culturally, the city embodies a rich heritage and a sense of place that cannot be replicated elsewhere. Furthermore, Montpelier has the potential to set a powerful precedent for small cities nationwide by demonstrating how communities can adapt and thrive in the face of modern challenges, from climate resilience to economic revitalization.

Relocation Challenges

Moving Montpelier is not a practical option, especially when flooding is a common issue across many communities all over the state of Vermont.

Economic and Cultural Significance

Montpelier's role as Vermont's capital and a hub for government, business, and tourism makes it crucial to protect.

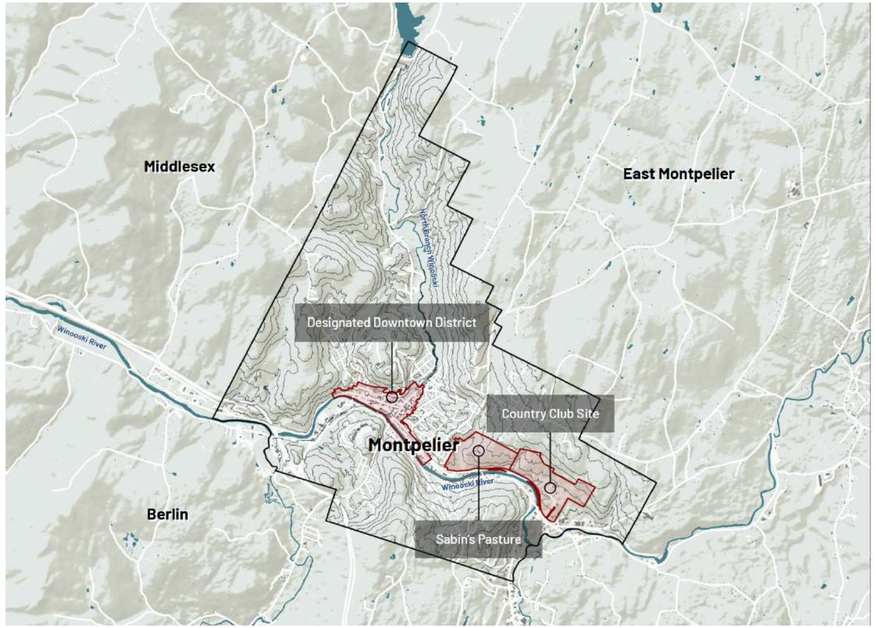
Setting a Precendent

Strengthening Montpelier can serve as a model for other towns in Vermont and beyond, showing how communities can adapt to and coexist with water sustainably.

03

PROPOSAL

TABLE OF CONTENTS



Sites of Interest Map

Source: Vermont Open Geodata Portal

- Undeveloped Land
- 20 ft Contours
- Buildings
- Water Bodies
- Site Sites of Interest

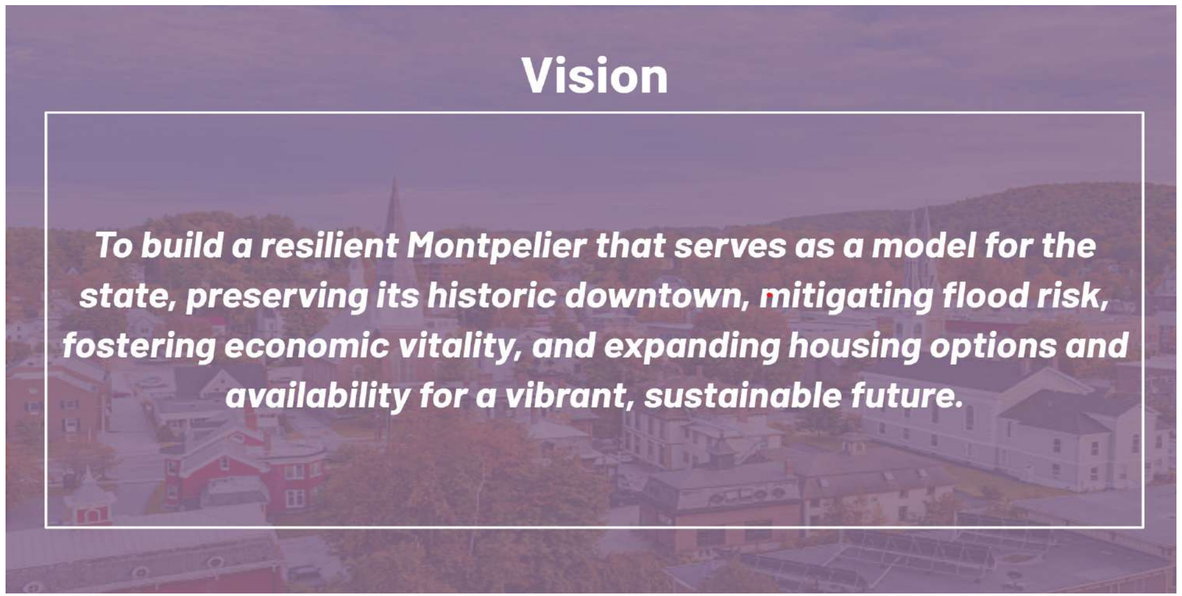
Montpelier Strategic Plan: A Vision for Growth, Preservation, and Resilience

Given the aforementioned challenges that Montpelier is facing, we propose a high-level strategic plan to help the capital and its residents to adapt, coexist, and thrive with water. This plan prioritizes proactive downstream efforts that address flood mitigation and historic preservation while also recognizing the growing demands for housing and recreation. The intention of our work is to ensure that Montpelier remains a resilient, vibrant, and sustainable place to live, work, and visit–now and for generations to come.

Proposed Plan

We are proposing a strategic plan that encompasses all of downtown Montpelier, Sabin's pasture, and the former country club site.

While we do not propose a strict planning horizon, it is clear that flooding will worsen in the coming years. Therefore, it is crucial to begin addressing these challenges sooner rather than later, with the goal of implementing meaningful interventions within the next 5 to 10 years.



GOALS

From our analysis, we have identified two primary goals for Montpelier.

The first goal is to enhance Montpelier's ability to and live with water by implementing sustainable flood resilience strategies that respect and preserve the historic character of downtown. This approach prioritizes readiness for future flooding events while maintaining the integrity of existing strcutures and embracing the downtown's unique relationship with water.

The second goal addresses the pressing housing shortage in Montpelier. By expanding accessible and sustainable housing options, we aim to tackle this challenge in a manner that aligns with and enhances the city's established character, providing potential solutions that benefit both the local community and the broader state.

FOCUS AREAS AND SUBGOALS

REVITALIZING THE RIVER'S EDGE

Adopt downstream strategies to reduce river velocity and reinforce riverbanks near downtown

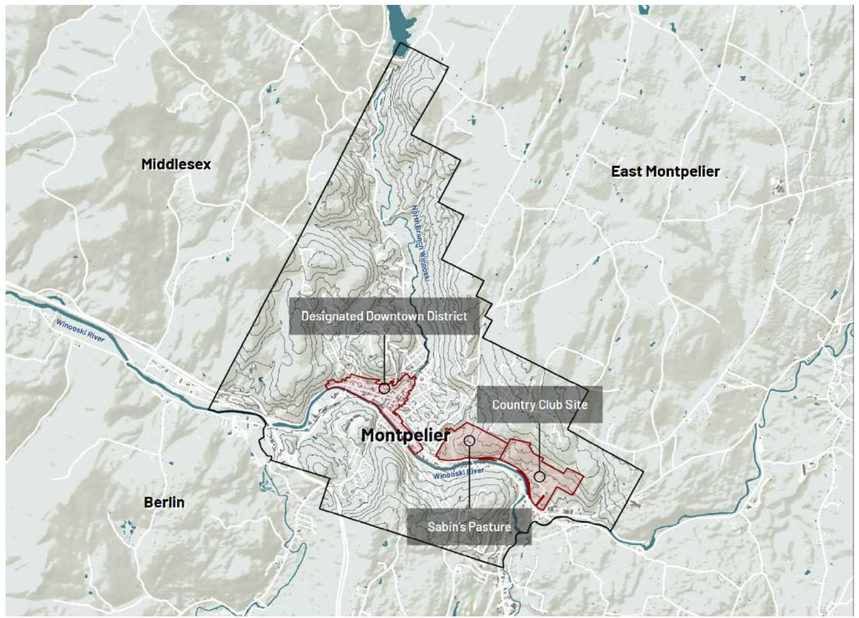
ENHANCING A GREEN & RESILIENT DOWNTOWN

Greening and enhancing downtown while promoting historic preservation and flood resilience

BUILDING A SUSTAINABLE HOUSING FUTURE

Develop a plan to increase housing units, diversify housing types, and meet community recreation needs

Aligning with our goals, we chose to concentrate on three key areas of Montpelier that we believe can significantly contribute to the town's overall well-being, independent of flood-related challenges. These areas—revitalizing the river's edge, enhancing a green and resilient downtown, and building a sustainable housing future—reflect a holistic approach to addressing Montpelier's needs. Together, they aim to strengthen the city's social, economic, and environmental fabric while preparing it for a thriving and adaptable future.



Sites of Interest Map

Source: Vermont Open Geodata Portal

- Undeveloped Land
- 20 ft Contours
- Buildings
- Water Bodies
- Site — Sites of Interest

Location Selection

To achieve thse goals, we have chosen to focus on downtown Montpelier, as well as Sabin's Pasture and the old Country Club Road site, as shown on the map on the left. We selected these based on the following key considerations:

Downtown Montpelier: This area experiences the most severe flooding during major events, making it critical for implementing resilience and revitalization strategies that can protect the city's core and preserve its economic vitality.

Sabin's Pasture and the Country Club Road Site: These locations cover over 200 acres of open space and are just eight minutes from downtown. With lower flood risk, they offer a prime opportunity for sustainable housing and infrastructure development, helping to reduce pressure on flood-prone areas.

04

RECOMMENDATIONS

TABLE OF CONTENTS

REVITALIZING THE RIVER'S EDGE

Adopt downstream strategies to reduce river velocity and reinforce riverbanks near downtown

ENHANCING A GREEN & RESILIENT DOWNTOWN

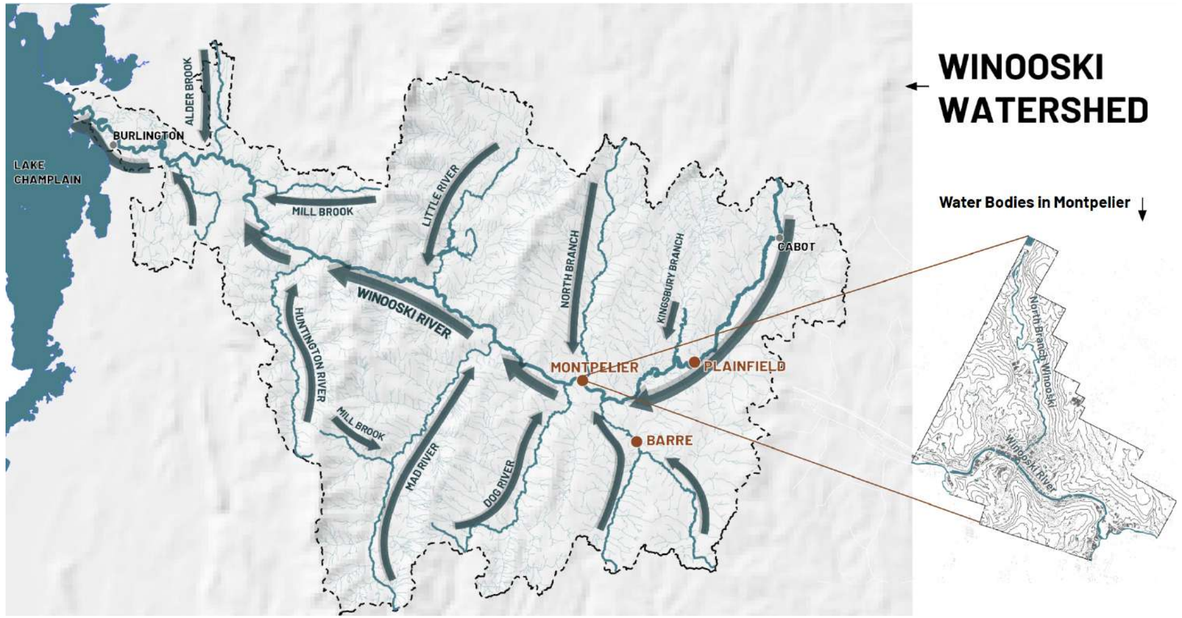
Greening and enhancing downtown while promoting historic preservation and flood resilience

BUILDING A SUSTAINABLE HOUSING FUTURE

Develop a plan to increase housing units, diversify housing types, and meet community recreation needs

The following pages outline our proposed recommendations for the Montpelier Strategic Plan. These strategies are organized within the three key focus areas noted above.

REVITALIZING THE RIVER'S EDGE

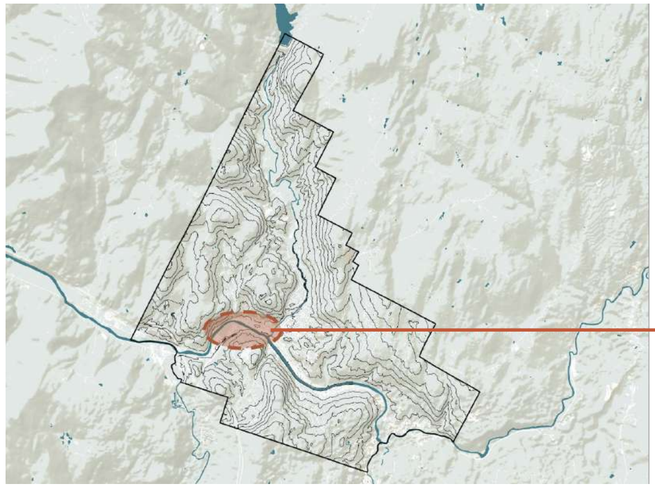


WINOOSKI WATERSHED

As mentioned before, Montpelier lies in the hear of the Winooksi watershed, where four branches—The Stevens Branch, North Branch, Dog River, and the Winooski mainstream—all converge. Within Montpelier, the combined length of the Winooski River and its North Branch totals about 7 miles, with 4.5 miles from the mainstream and 2.5 miles from the North Branch.

However, Montpelier remains vulnerable to flooding, particularly during heavy rainfall or snowmelt, and the town is completely surrounded by water, making flooding unfortunately inevitable.

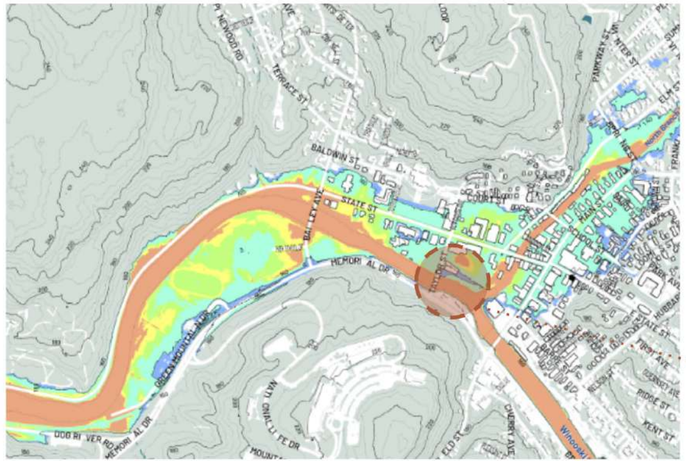
PROJECT OVERVIEW



River's Edge Plan
Winooski River (Downtown)

The Montpelier Strategic Plan proposes a Downtown Winooski River revtitalization project to strengthen the river's edges in the downtown area.
Floodwaters in Montpelier often stem from the confluence of the Winooski and North Branch Rivers, which creates a natural bottleneck in the downtown area. This intensifies flood risks, making resilience planning critical. Downtown Montpelier, as the city's economic and civic hub, is particulary vulnerable, as seen during Tropical Storm Irene in 2011 and the 2023 floods.
While the proposed projects will help manage water velocity, they cannot prevent flooding during large storms. To address flood risks from major events, broader, long-term solutions like upstream interventions are necessary. Additionally, the project aims to provide economic and public amenity benefits by attracting people to the river, celebrating its presence, and enhancing the waterfront experience.

SEVERITY OF FLOODING IN MONTPELIER



Flood at Different Water Height Levels

Height of Winooski
21 feet

Community Impact
100+ people rescued

Economic Impact
$200M+ in damages to government buildings, businesses, and city-owned properties

Main Issues
High-velocity flooding and overwhelmed river

Flooded Downtown Montpelier (2023) - "The confluence of the Winooski and North Branch rivers flooded downtown Montpelier with several feet of water."
Sources: The Montpelier Bridge; Landscape Architecture Magazine

Not to repeat too much of what has already been mentioned, but it is important to emphasize the severity of the floods that impact Montpelier. The Great Flood of 2023, though not the worst in history, stands out as one of the most significant in both Montpelier's and Vermont's history.

In 2023, the Winooski River's gauge height was recorded at 21 feet, causing stormwater to inundated most of the downtown. 100s of people needed to be rescued from their cars and homes, over 140 downtown businesses were impacted anddozens homes became uninhabitable. The economic impact of the flood was devastating, with $100 million in damages to government buildings and an additional $100 million in damages to downtown businesses.

The primary issue leading to the Capitol's inundation wasn't just flooding itself but the high-velocity downstream flow. The fast-moving water surged through the river with nothing to slow it down and no other place to go, ultimately spilling into the city.

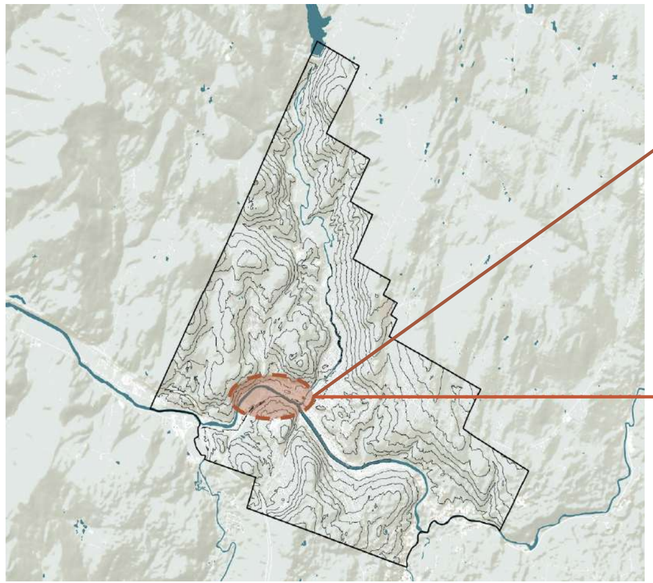
VALUABLE COMMUNITY ASSETS

Source: Google Earth

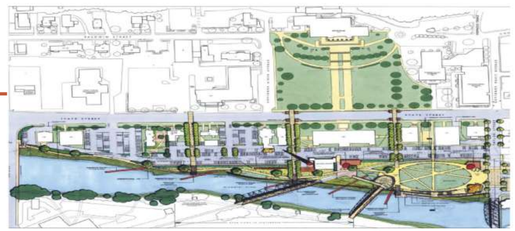
Valuable Community Assets

The Winooski River has shaped Montpelier into the town it is today, playing a central role in its identity and history. Many vital community assets—integral to daily life—are located along the river's edge. Safeguarding these resources is essential to ensuring the long-term resilience and prosperity of downtown Montpelier.

FORMER PLANS ACKNOWLEDGEMENT



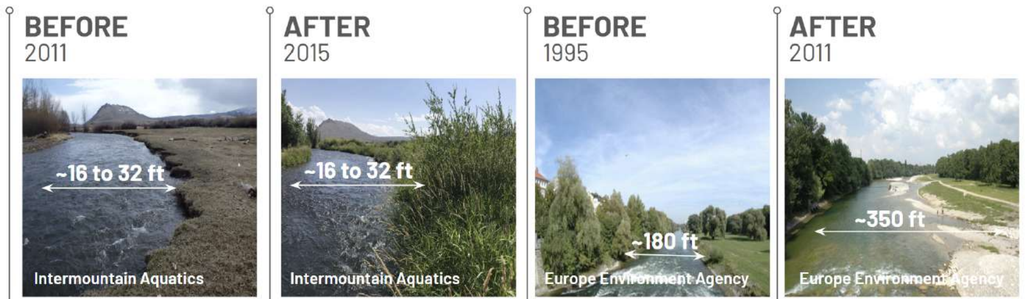
Source: Confluence Park (2023), Montpelier Strong



Source: Winooski River Greenway Plan (2018) Montpelier Strong

This work builds on the foundation of previous efforts, including the 2018 Winooski River Greenway Plan and the 2023 Confluence Park Plan.
Although these plans have not been implemented, they have significantly inspired and informed the strategies we are presenting.

CASE STUDIES



Swanson Side Channel, Salmon River, Idaho

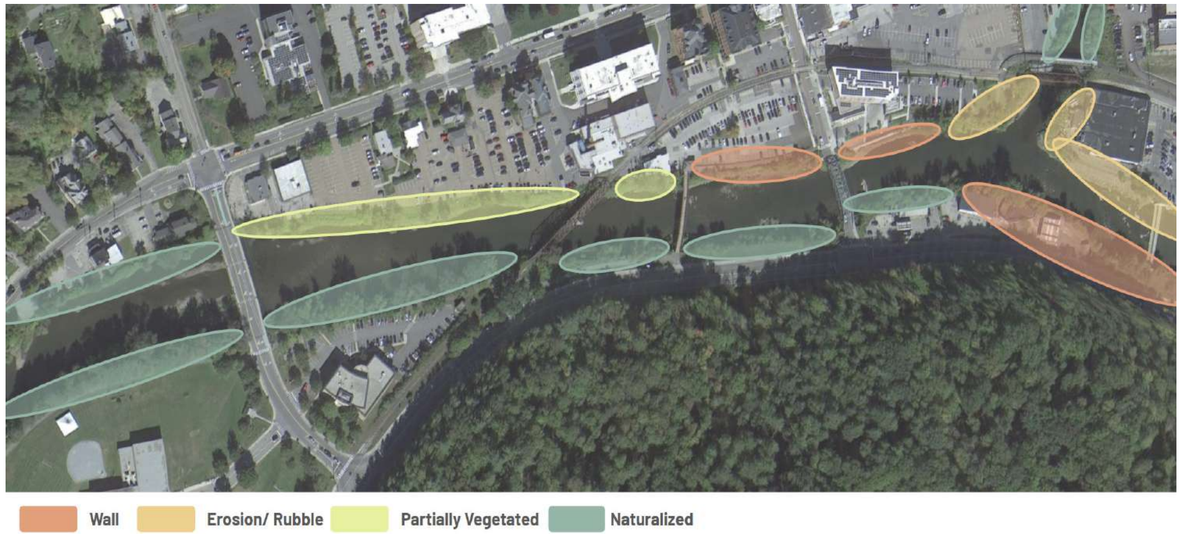
Isar River, Munich, Germany

These examples share similarities with the challenges along the Winooski River. In Idaho, efforts to combat riverbank erosion and manage recurring floods parallel issues seen near Montpelier. Similarly, Munich's work on the Isar River addresses the impacts of channelization and urban runoff, echoing the dynamics at the confluence of the Winooski and North Branch Rivers. Both cases highlight approaches that integrate flood management with ecological restoration and community enhancement, offering relevant insights for the Winooski.

RIVER'S EDGE PLAN: CONTEXT MAP

This project focuses on a half-mile stretch of the Winooski River, extending from the confluence behind Shaw's grocery store to the area near Montpelier High School.

RIVER'S EDGE PLAN: EDGE TYPE MAP



The map above categorizes the edges of the Winooski River into four main types, based on observations from our visit in October. Areas marked in red indicate sections with a wall, while orange highlights locations showing visible signs of erosion or rubble. Light green denotes partially vegetated areas, which may also include impervious surfaces, and dark green represents natural areas with grass, leaves, dirt, woody branches, and similar features.

RIVER'S EDGE PLAN: INTERVENTIONS

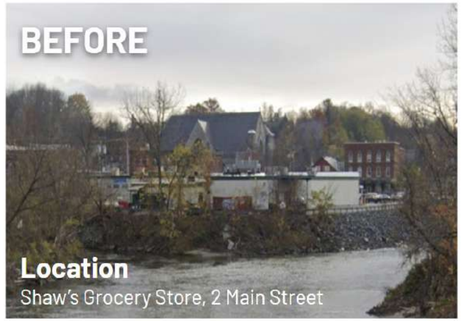
WALLS

ISSUE
Walls along the Winooski River channelize the flow of water, making flooding more severe especially near the confluence.

POTENTIAL INTERVENTION:
Terraced Retaining Walls

Especially where walls cannot be removed, terraced retaining walls can be introduced. They are typically constructed using stacked stones or reinforced concrete to create tiered steps along the riverbank. These terraces help reduce river velocity, while added vegetation slows floodwaters by stabilizing the soil with root systems.

RIVER'S EDGE PLAN: INTERVENTIONS



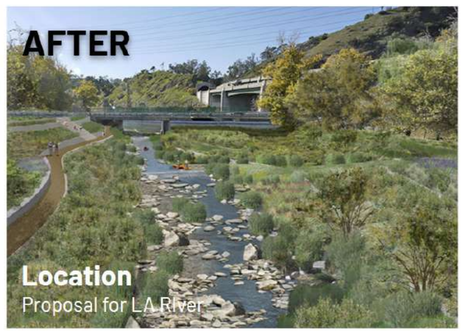
EROSION AND RUBBLE

ISSUE
Visible erosion and the presence of rubble along the Winooski RIver can decrease bank stability, which may disrupt the natural flow and filtration of water. This destabilization can lead to increased sedimentation, obstructing the river's path and reduce its capacity to manage high water volumes.
Combined, all of these elements ultimately raise flood risk.

POTENTIAL INTERVENTION:
Riparian Buffers

Where there is current erosion and rubble along the riverbank, riparian buffers can help stabilize the soil. Adding vegetation prevents further soil erosion, filters runoff, absorbs excess nutrients, and reduces flood impacts by slowing stormwater, protecting adjacent buildings and infrastructure. Additionally, regreening the riverbanks enhances the area's aesthetic appeal, making it more attractive to residents and visitors while improving biodiversity and creating naural habitats.

RIVER'S EDGE PLAN: INTERVENTIONS



PARTIALLY VEGETATED + NATURALIZED RIVER EDGES

ISSUE

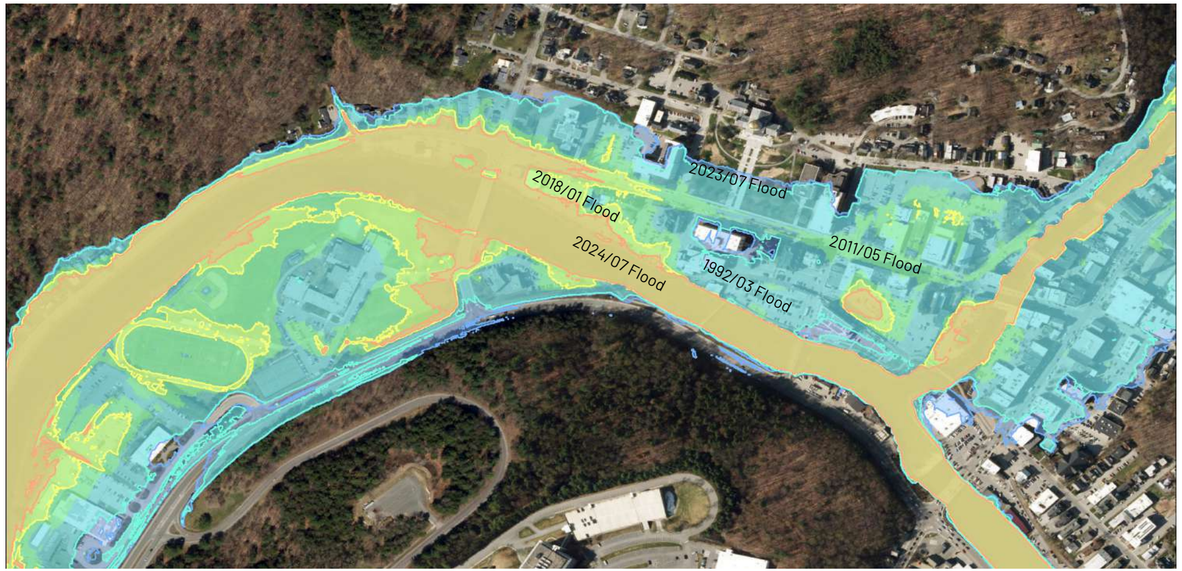
Insufficient vegetation along the riverbank contributes to higher river velocity, increased flood risk, and a missed opportunity to celebrate the Winooski as a community asset.

POTENTIAL INTERVENTION: Widen Riverbank with Vegetation

Widening the riverbank with vegetation, particularly in areas that are partially vegetated or naturalized, can help stabilize soil, reduce erosion, and slow floodwaters. It is important to note that water flows fastest toward the middle, so adding vegetation within in the river may also be beneficial to slow down its velocity. This approach improves water filtration, mitigates flood risks and creates attractive, natural spaces along the river

IDENTIFYING AREAS FOR RIVER WIDENING

The aerial image above highlights the half-mile stretch of the Winooski River where proposed interventions are focused. The river measures approximately 180 feet in width, with buffers that rarely exceed 30 feet between the river's edge and nearby development, typically asphalt. This proximity underscores the lack of space for floodwaters to disperse, forcing them directly into downtown during flood events.



The map above provides a closer view of the same 0.5-mile stretch of the Winooski River, overlaid with estimated inundation layers from five recent major floods. This layer highlights areas at varying levels of flood risk:

Orange areas represent the estimated inundated area during 2024/07 flood, and is the area under highest flood risk.

The yellow an green areas represent the estimated inundated area during 2018/01 and 2011/05 flood. At the water height level of 2011/05, centerlines of major streets (including State St) will be inundated.

The cyan and blue areas represent the estimated inundated area during 1992/03 and 2023/07 flood. At these water height levels, most areas in downtown Montpelier will be inundated.

CRITERIA FOR AREAS WHERE THE RIVER COULD BE WIDENED

Drawing on multiple sources, the following criteria outline potential areas where the Winooski River could be widened. These considerations, while not exhaustive, provide guidance for identifying areas suitable for widening interventions.

It is important to note that not all rivers, or sections of rivers, are suitable for such efforts. Upstream locations, where there is less development and more natural land cover, often provide greater feasibility and ecological benefit compared to heavily urbanized downtown areas. In Montpelier's downtown, widening the river may require the acquisition or partial acquisition of privately or publicly owned parcels, introducing logistical, legal, and financial challenges.

Moreover, successful interventions depend on factors like intact sediment sources, long river stretches, and minimal infrastructure interference, emphasizing the need for a strategic, context-sensitive approach.

Frequent Flooding
Widening riverbanks and adding vegetation slows floodwaters, stabilizes soil, and protects key infrastructure, helping Montpelier adapt and safeguard downtown assets.

Extended Reaches
Long stretches of river are ideal for widening efforts, maximizing the intervention's effectiveness.

High Bedload
Areas with significant sediment transport (high bedload) are well-suited for widening projects

Proximity to Near-Natural Upstream Reaches
Widening is most effective when upstream sections of the river remain near-natural, providing ecological connectivity.

Intact or Minimally Impaired Bedload
Formerly braided rivers with intact or minimally disturbed bedload are ideal candidates for successful widening interventions.

POTENTIAL RIVER WIDENING SITES

Widening the Winooski River, where possible, would give the river more space to manage frequent flooding, especially in flood-prone areas like downtown Montpelier. This approach could be highly beneficial, but challenges such as development constraints, property rights, and costs may limit feasibility. We recognize that widening the river may lead to resistance due to potential property loss and the possibility of slower water flow during certain events. However, creating room for the river would improve flood resilience by allowing floodwaters to dissipate more gradually, reducing the risk of downstream damage. Additionally, it could transform the river into a community asset, celebrated rather than seen as a threat, offering opportunities for recreation, green space, and economic development. This approach could also serve as a beneficial upstream intervention to reduce flood risk, but our primary focus remains on downtown Montpelier due to its vulnerability and the potential for revitalization through strategic river widening.

Based on the available information, we have identified the current high school site and several parcels directly across the river as promising locations for future river widening. Given that the high school already experiences flooding, it is likely that a new facility will eventually be required. When that time comes, it presents an ideal opportunity to repurpose the site to support river widening efforts. However, further research and analysis by engineers and other experts would be required to assess the feasibility of these sites, ensuring that any interventions are structurally sound and meet the necessary environmental, legal, and logistical considerations.

POTENTIAL RIVER WIDENING SITES

Pacel Owners
A: City of Montpelier B: 152 State Street LLC C: VT Association of Realtors Inc D: VT State Employees Credit E: State of Vermont
F: State of Vermont G: State of Vermont H: State of Vermont I: Vermont State Employees J: State of Vermont

POTENTIAL RIVER WIDENING SITES

The following parcels have been identified as potential candidates for future river widening efforts due to their proximity to the Winooski River. These parcels have significant portions of their area within high flood risk areas, making them critical considerations for flood management strategies.

For instance, nearly one-third of the Montpelier High School property, owned by the City of Montpelier, lies within the high flood risk area. Similarly, nearly half of the State's parking lot along Route 2 (labeled as Parcel F on the aerial image, located between E and G) falls within this zone. In the event of a significant flood, these areas are at high risk of inundation, underscoring their potential for reimagined flood mitigation measures.

These parcels could either be considered for physical river widening or repurposed as open overflow zones where floodwaters can spread without causing extensive damage to critical infrastructure. While such efforts might require the relocation or removal of important assets, such as the High School or parking lots, the long-term benefits of improved flood resilience and reduced risk of catastrophic damage outweigh these challenges.

As previously noted, implementing a project of this scale will require further detailed studies, including engineering assessments and stakeholder engagement.

Despite these complexities, examples exist of successful projects where river widening has enriched downtown areas, transforming flood-prone zones into community assets. Despite these complexities, future river widening efforts should not be viewed as a burden but as an opportunity for enrichment and a celebration of the river, fostering a more resilient and vibrant Montpelier.

POTENTIAL INTERVENTIONS

POTENTIAL INTERVENTIONS

For parcels identified as A, B, and C, these areas present opportunities for river widening measures as deemed appropriate by the City of Montpelier. Similar concepts have been proposed for the Los Angeles River, offering valuable inspiration. The photos on the upper right illustrate the LA River in 2016 alongside proposed plans that include widening the river, introducing natural meanders, and re-greening the surrounding area. While the LA River project is large in scale, its principles can be adapted to Montpelier's context.

Potential interventions could involve revegetation, removal of structures, and repurposing underutilized parking lots. Additionally, new trails, recreational amenities, and green spaces could be developed, transforming these areas into community assets. More trees can also be planted along the river's edges as they can absorb a lot of water. Such measures not only enhance public enjoyment but also provide designated floodable zones, allowing excess water to spill into these areas during floods and reducing the risk of damage to buildings and harm to residents.

The same approach can be applied to parcels I and F. However, given the limited availability of parking in downtown Montpelier, alternative interventions could help preserve this essential function while supporting river widening efforts. For inspiration, Boston's Public Market Garage serves as an excellent example. This relatively small parking structure, located above the Boston Public Market, provides convenient access to nearby destinations. It is multi-use, compact in scale, and seamlessly integrates into the urban landscape without dominating the surroundings. It is also worth noting that state parking lots would likely need to be replaced with a garage located out of harm's way. While constructing a garage and undertaking river edge work involves significant costs, the long-term savings from avoiding repeated flood damage make this investment worthwhile.

Adopting similar principles in Montpelier could allow for efficient use of space while maintaining parking availability. Additionally, incorporating permeable surfaces, stormwater management systems, or green roofs into such structures could further mitigate flooding by enhancing water absorption and reducing runoff. These strategies would not only support flood resilience but also align with broader goals of urban sustainability and community-centered design.

How will these interventions benefit Montpelier with or without the event of flooding?

Flood Resilience
Widening riverbanks and adding vegetation slows floodwaters, stabilizes soil, and protects key infrastructure, helping Montpelier adapt and safeguard downtown assets.

Improved Water Quality
Native vegetation alongside riverbanks filters runoff, trapping sediments and absorbing pollutants before they can enter the water. This intervention promotes cleaner waterways and supports Montpelier's overall environmental health.

Increased Public Health and Safety
Managing flood risks helps protect buildings, roads, and utilities, creating a safer environment for residents.

Access to Green Spaces and Recreation
Revitalized riverbanks offer opportunities for public trails, parks, and gathering spaces, connecting people with nature. These areas encourage outdoor activities, enhancing the quality of life for residents and tourists alike.

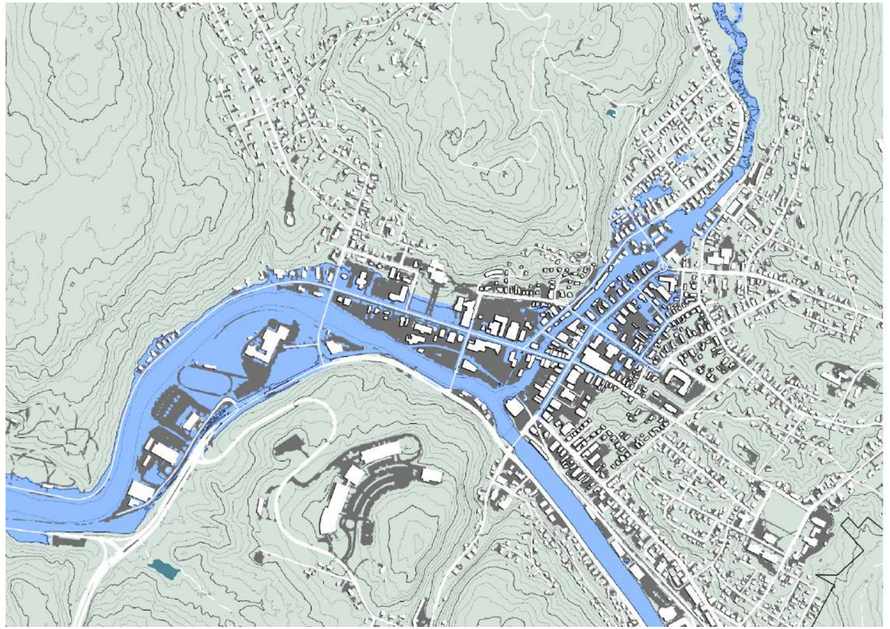
Economic Benefits and Community Engagement
Enhanced green spaces and resilient infrastructure can attract visitots, new residents, and investments, boosting Montoelier's economy. Community-led initiatives to restore and maintain these spaces foster civic pride and strengthen local engagement.

*Note: These interventions are not designed to stop flooding from happening but rather to mitigate its impacts, help Montpelier adapt to floodwaters, and provide added benefits like improved water quality, enhanced green spaces, and increased community resilience.

GREEN & RESILIENT DOWNTOWN

Greening for Flood Resilience & Vibrant Communities

Preserving Downtown's Historic Buildings



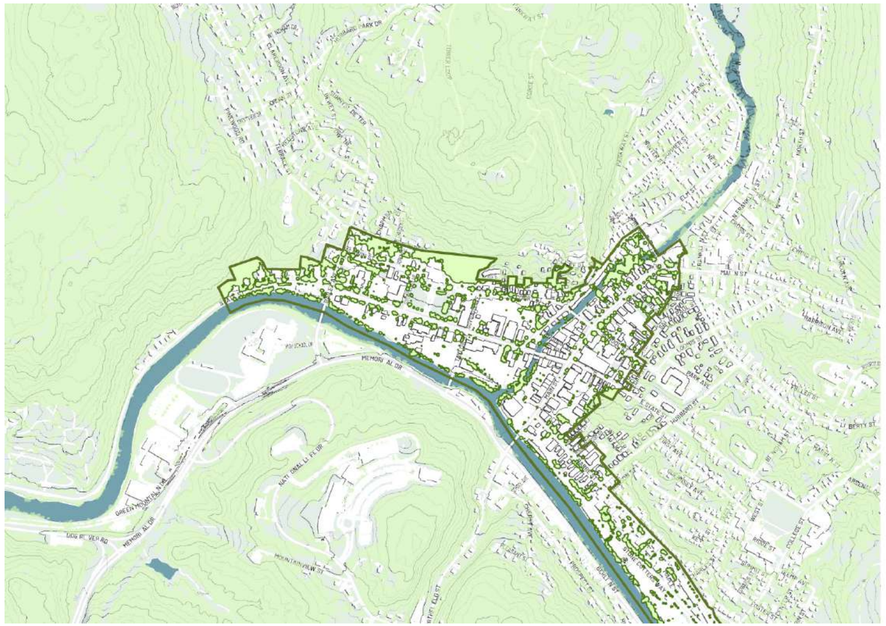
Downtown Impervious Surface Map

Source: Vermont Open Geodata Portal

- Undeveloped Land
- 160 20 ft Contours
- 5 ft Contours
- Buildings
- Water Bodies
- STATE ST Roads
- Impervious Surface
- Inundation Area At 526.20ft (Highest Water Mark 2023/07)

70%+ of Impervious Surfaces in Montpelier Downtown Area will be Inundated If a Flood Similar to 2023 were to Occur Again

The map above illustrates that if a flood similar to the 2023 event were to recur, approximately 70 percent of downtown Montpelier could become inundated. Such an event would likely result in significant damage to historic buildings, homes, and other critical infrastructure, underscoring the urgent need for proactive flood mitigation measures.



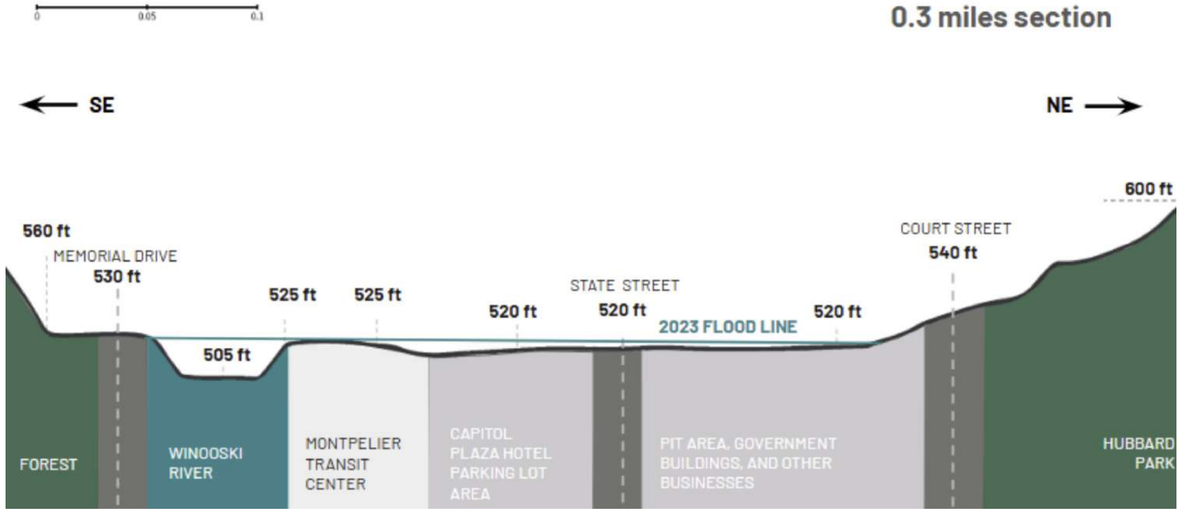
Downtown Montpelier Tree Canopy Map

Source: Vermont Open Geodata Portal

- Undeveloped Land
- 160 20 ft Contours
- 5 ft Contours
- Buildings
- Water Bodies
- STATE ST Roads
- Tree Canopy in Downtown District
- Tree Canopy outside of Downtown District
- Designated Downtown District

~18% of Area in Downtown District is Covered by Trees

The map above highlights that, despite being surrounded by dense forest, Montpelier's downtown has only about 18 percent tree coverage. This limited vegetation reduces the area's ability to absorb rainfall, leaving excess water with nowhere to go, thereby exacerbating flood risks.



This section outlines the approximate floodline from the 2023 event, which crested at 21 feet, corresponding to an elevation of roughly 525 feet. It highlights the downtown area most affected by the flood, characterized by extensive impervious surfaces (depicted in gray), which prevent water absorption and exacerbate runoff. The combination of abundant impervious surfaces and steep surrounding terrain significantly contributed to the severity of flooding in this area.

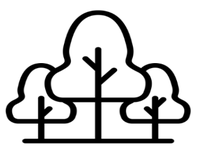
Drone footage of Montpelier during the 2023 floods vividly captures the extent of the disaster. The footage reveals submerged streets,

STRATEGIES TO ENHANCE RESILIENCE IN IMPERVIOUS AREAS

Rain harvesting

Biorentention Basins & Ponds

Roadside Green Infrastructure



Plant More Trees

STRATEGY 1: RAIN HARVESTING

Downspout planter


Rain Barrel

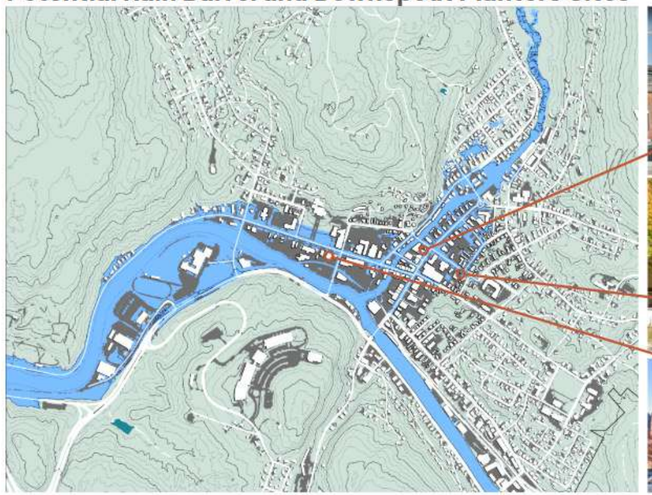

Rain Barrels

Approximate cost per system: ~$140

The first image is of a downspout planter, the latter two are of rain barrels. Both downspoit planters and rain barrles represent simple yet highly effective interventions for manageing stormwater. These rain harvesting tools can help retain and divert water from entering the river during everyday rain events, reducing excess runoff. They are cost-effective solutions, with cities like Philadelphia even offering free barrels to residents. These planters and barrels can easily installed in various locations, providing a convenient way to capture water for non-potable uses, as demonstrated in the exampled above.

STRATEGY 1: RAIN HARVESTING

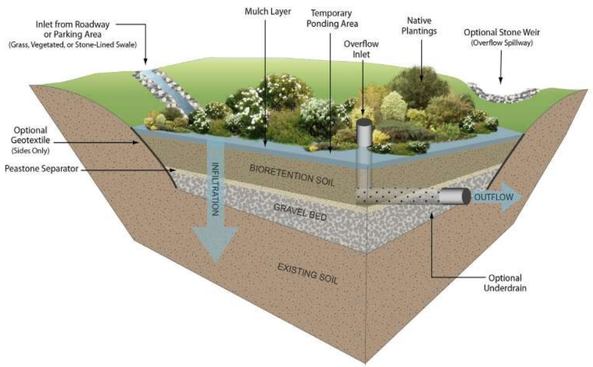
Potential Rain Barrel and Downspout Planters Sites



Location Variety

Rainwater harvesting, while not a solution to stop large-scale flooding, can help alleviate the burden on the Winooski River during everyday rain events. By capturing and storing rainwater in barrels or downspout planters, water that would otherwise flow into the river is diverted, reducing the overall volume entering the system. This approach, while not intended to prevent flooding, can lessen runoff and help manage water flow. Rain barrels can be placed in a variety of locations—behind businesses, next to homes, and along office buildings—where rainwater naturally flows or can be directed by gutters. While the inundation map on the left demonstrates the severity of flooding, widespread use of rain barrels could significantly reduce the volume of water that enters the Winooski River, contributing to broader flood mitigation efforts.

STRATEGY 2 : BIORETENTION BASINS AND PONDS



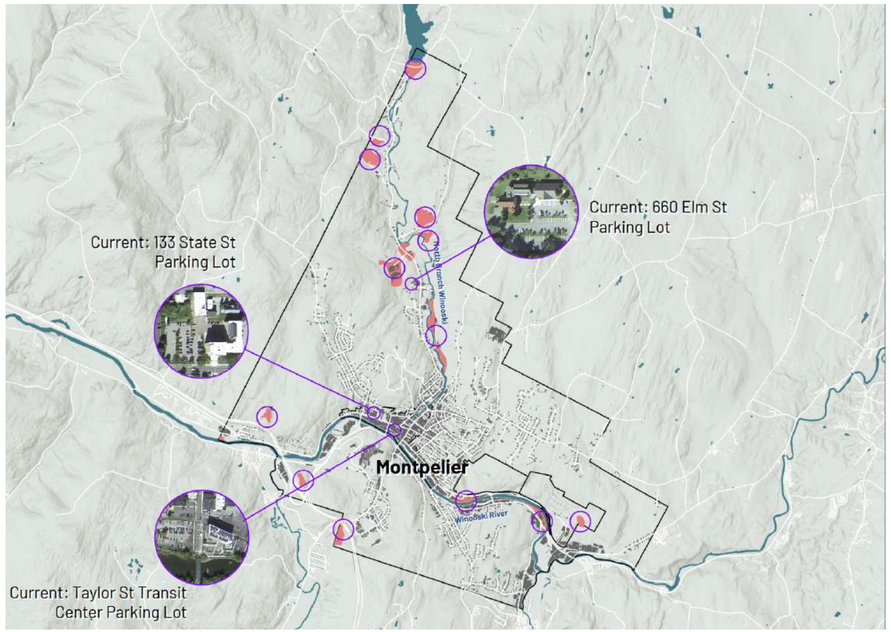
Bioretention Pond Diagram

Bioretention basin in Plymouth, Massachusetts

Approximate cost: $17.50 to $35/m3

Bioretention helps manage stormwater and reduce flooding by allowing water to pond in shallow depressions with sandy soil, filtering runoff. A grass buffer slows water velocity, and an organic mulch layer supports microorganisms that break down contaminants. Pollutants are filtered, adsorbed, and transformed, making bioretention an effective tool for flood mitigation and environmental management. While bioretention systems cannot prevent flooding from extreme weather events, they can significantly reduce the severity and frequency of flooding by capturing and slowing the flow of runoff. This helps alleviate pressure on drainage systems and can prevent localized flooding, minimizing erosion and improving water quality. In addition to flood reduction, bioretention provides environmental benefits such as habitat creation, improved biodiversity, and enhanced aesthetic value, contributing to the overall health and resilience of urban ecosystems.

STRATEGY 2: BIORETENTION BASINS AND PONDS



These basins and ponds are not new to Montpelier; in fact, the city already has several, as shown on this map. Two are located in the downtown area, one in the State Street parking lot and another in the Taylor Street Transit Center parking lot, with a third located further north in a parking lot on Elm Street. These types of stormwater management systems are typically found in parking lots, where large, impervious surfaces create significant runoff.

STRATEGY 2: BIORETENTION BASINS AND PONDS

Current Bioretention Basins in Montpelier

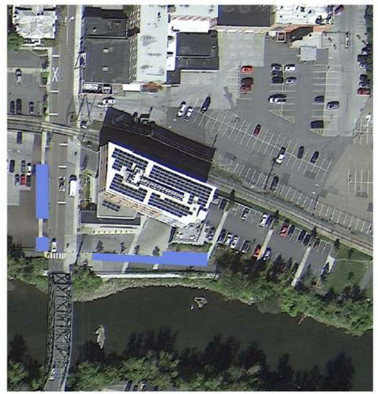
130 State St Parking Lot

Approximately 1800 ft2

660 Elm St Parking Lot

Approximately 4500 ft2

Taylor St Transit Center Parking Lot

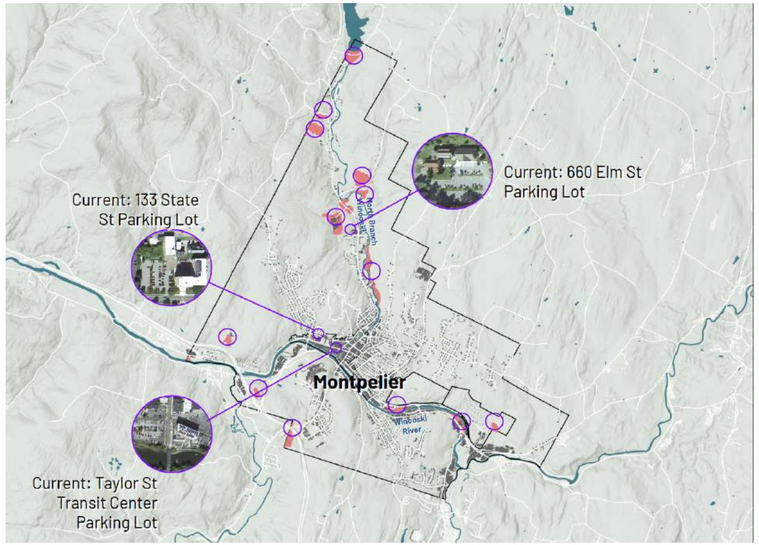


Approximately 3500 ft2

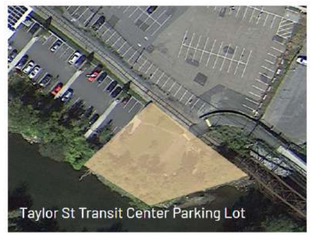
All relatively small in scale

Montpelier already has several bioretention basins and ponds throughout the city, as shown in the aerial images above. However, these basins are relatively small in scale, as indicated by the blue markings on the map.

STRATEGY 2: BIORETENTION BASINS AND PONDS



Potential bioretention basin and pond locations in downtown



We propose two areas that could be transformed into bioretention basins and/or ponds to enhance stormwater management in Montpelier. First, we propose expanding the existing infrastructure at Taylor Street by connecting the current basins to a larger pond, creating a unified stormwater system. This underutilized piece of land, situated near the river, offers significant potential for capturing and managing water runoff. Second, we suggest addressing the PIT area, where water tends to pool during rain events due to its elevation and asphalt surface. Installing a basin in this location would help manage runoff, improve the parking lot's appearance, and reduce heat, creating a cooler environment during hot summer days while enhancing overall stormwater management. While these interventions will not prevent flooding, studies show that vegetation, such as trees and native plants, can absorb water, reduce runoff, and help manage

STRATEGY 3: ROADSIDE GREEN INFRASTRUCTURE

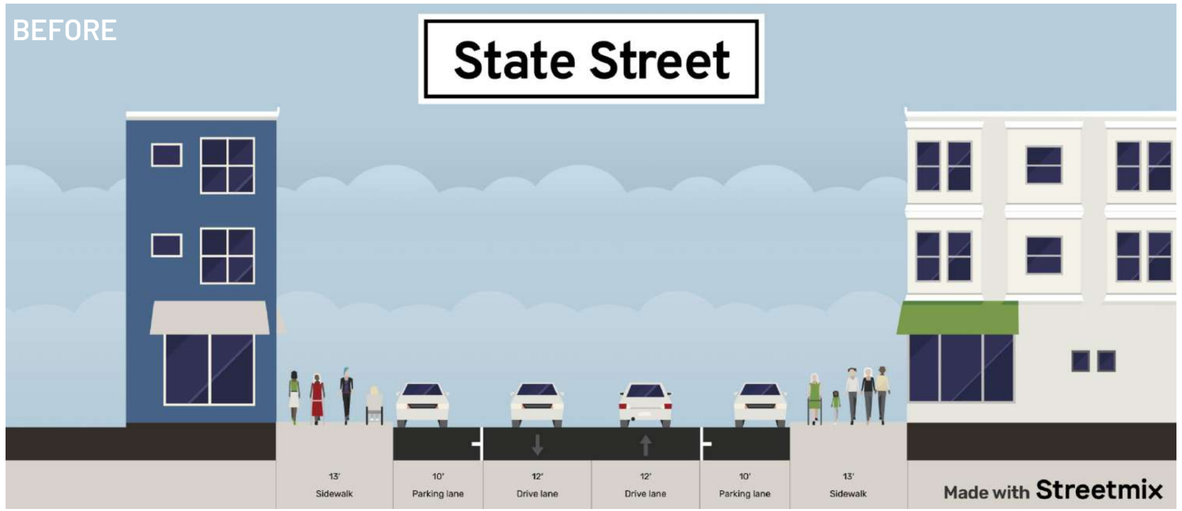
Approximate cost of a street tree: $300 (Angi's List)

Montpelier could greatly benefit from roadside green infrastructure, such as stormwater planters and street trees, which absorb rainwater, reduce runoff, and alleviate flood risks. These features not only help manage stormwater but also contribute to cooling streets, improving air quality, and enhancing the city's overall aesthetics. Additionally, their deep roots help stabilize soil, supporting long-term climate resilience and promoting environmental sustainability in the urban landscape.

STRATEGY 3: ROADSIDE GREEN INFRASTRUCTURE

While walking along State Street, we admired the architecture and vibrant street art, but it wasn't until we reached the State House that we encountered any green infrastructure. The lack of such features along the main stretch highlighted a missed opportunity for enhancing the street's sustainability and resilience. Green infrastructure, like street trees and stormwater planters, could significantly improve stormwater management, reduce flooding risks, and enhance the overall aesthetic of the area. Incorporating these elements into State Street would not only contribute to the city's environmental goals but also create a more inviting and resilient urban environment.

STRATEGY 3: ROADSIDE GREEN INFRASTRUCTURE



Both images display street sections of State Street in downtown Montpelier. In the top section, the driving lanes are approximately 12 feet wide, parking lanes are 10 feet wide, and the sidewalks span about 13 feet, providing a comfortable pedestrian experience. However, the space could be further enhanced with green infrastructure as shown in the bottom street section.

STRATEGY 3: ROADSIDE GREEN INFRASTRUCTURE

By reducing the width of the parking and driving lanes and sidewalks by just one foot on each side, a total of 6 additional feet could be allocated for street trees and other plants. This small adjustment would help manage rainwater runoff, diverting it from the river, while also creating a more attractive and inviting environment for both locals and visitors.

STRATEGY 4: PLANT MORE TREES


Athens, GA


Dalla, TX


North Charleston, SC


L.A County, CA


Philadelphia, PA


Austin, TX

Planting more trees is a highly impactful strategy for urban areas, offering diverse environmental, social, and economic benefits. Trees can absorb significant amounts of water through their roots, intercept rainfall with their canopies, and reduce surface runoff, mitigating urban flooding. A mature oak tree, for instance, can absorb over 100 gallons of water a day (Princeton Tree Care). Trees also improve air quality by removing pollutants like ozone and particulate matter, and they combat the urban heat island effect by lowering local temperatures by up to 9°F (US EPA).

In addition to their environmental benefits, trees enhance urban aesthetics, increase property values by up to 10% (Arbor Day Foundation), and foster community well-being, with studies linking green spaces to reduced stress and improved mental health. They also help reduce energy costs, with strategically planted trees saving up to 25% on cooling bills (US Forest Service). Trees are versatile and can be planted in streetscapes, parks, or even vacant lots. In addition, according to a study done by the US EPA in 2017, urban forestry can provide great returns on investment, with cities accruing $1.50–$3.00 in benefits for every dollar spent, with annual net gains of $30–$90 per tree (US EPA).

Overall, trees are a cost-effective, multipurpose solution for urban resilience, providing long-term benefits that extend well beyond flood mitigation.

STRATEGY 4: PLANT MORE TREES

Vermont is renowned for its lush, forested landscape—a legacy reflected in its name, a French portmanteau of “vert” (green) and “mont” (mountain). According to the Vermont Woodlands Association, the state is nearly 78 percent forested, with 4.5 million acres of trees. Montpelier itself is extensively wooded, but downtown tells a different story.

Our research shows that only 18 percent of Montpelier’s designated downtown area is covered by trees. This lack of canopy means rainwater often pools on impervious surfaces or is channeled directly into the river, increasing strain on
waterways. More runoff into the river during even moderate rainfall events exacerbates flood risks, leaving downtown more vulnerable to flooding.

Trees, however, could provide a natural solution. **A single tree can store over 100 gallons of water**, and incorporating trees into urban landscapes can reduce annual runoff by 2–7 percent, with natural landscaping approaches cutting storm runoff by up to 65 percent. In some areas, this combination can retain 100 pervent of rainfall on-site (Arbor Day Foundation). While trees alone won’t prevent future flooding, they are a critical component of a broader strategy that includes improved drainage systems and floodplain management.

Trees can be planted wherever the city sees fit, but focusing on areas such as the Winooski River, parking lots, and busy streets like State Street would be particularly effective. For Montpelier, increasing the downtown tree canopy isn’t just practical—it’s an extension of Vermont’s identity. Planting more trees would embrace the state’s forested heritage while building resilience against future floods.

HIGH UP-FRONT COSTS WITH LONG-TERM BENEFITS

$7 to $1

Flood-resilient infrastructure savings

Pew, 2018

100 gallons

A single, mature tree can store up to 100 gallons of water

Arbor Day Foundation

40

New jobs created for every $1 million invested in flood infrastructure

Johns Hopkins, 2024

41.1%

of 43 states surveyed saw reduced costs after GSI

EPA, 2012

48 pounds

A single mature tree alone can absorb over 48 pounds of CO2 annually

Arbor Day Foundation, 2024

10-40%

Average interception of rainfall by a forest canopy ranges from 10-40%

PennState, 2022

HIGH UP-FRONT COSTS WITH LONG-TERM BENEFITS

Lastly, it is important to note that the proposed interventions can be costly in terms of time, money, and resources. Many of these projects are large in scale and require thorough research, engineering, and time to prove their efficacy. However, despite the initial expenses, research shows that these interventions offer significant long-term benefits, such as enhanced flood resilience, improved environmental health, and increased community well-being.

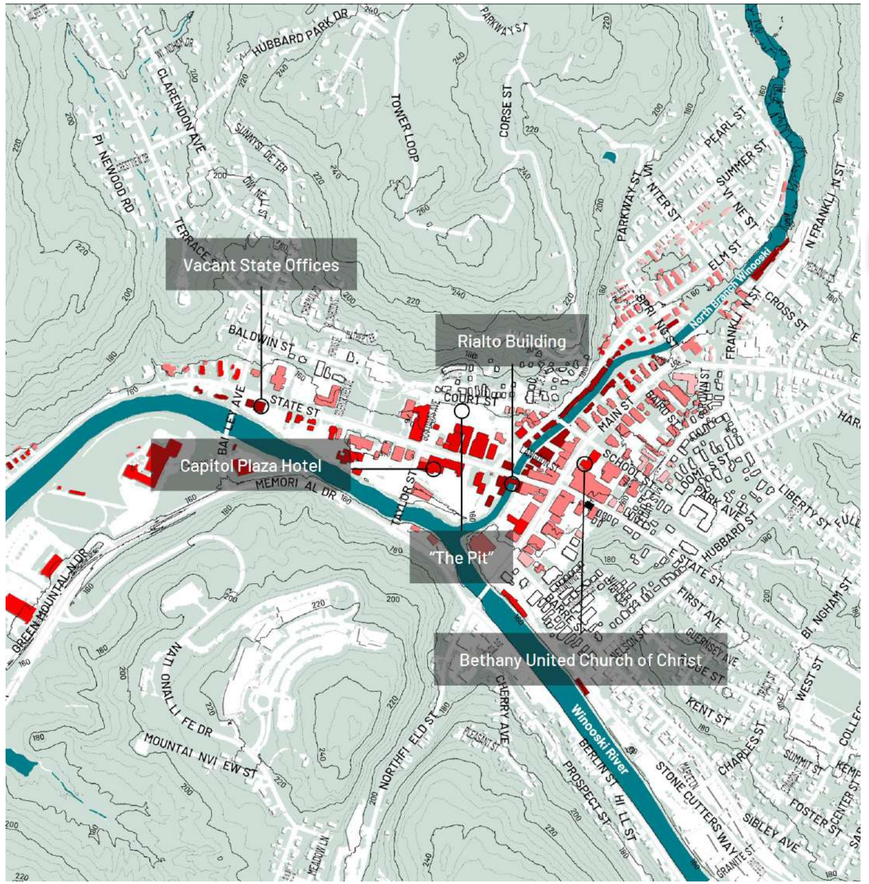
Green stormwater infrastructure stands out among other potential interventions for Montpelier due to its ability to mitigate flooding, reduce stormwater runoff, and improve water quality. By incorporating trees, permeable surfaces, and rain gardens, the town can implement natural solutions that not only enhance its resilience but also contribute to overall sustainability.

Beyond these flood-related benefits, green stormwater infrastructure offers additional advantages. It helps reduce the urban heat island effect, improves air quality, and provides valuable recreational and aesthetic spaces for the entire community. Furthermore, it supports biodiversity by creating habitats for local wildlife and enhancing the natural environment. These combined benefits improve the quality of life for residents and contribute to the town's long-term health and vitality.

GREEN & RESILIENT DOWNTOWN

Greening for Flood Resilience & Vibrant Communities

Preserving Downtown's Historic Buildings



Data Source:
Vermont Open Geodata Portal

- Undeveloped Land
- 160 — 20 ft Contour
- 5 ft Contour
- Undeveloped Land
- Water Bodies

Estimated Buildings at Risk

- At 519.12 ft (61 Buildings)
- At 520.28 ft (79 Buildings)
- At 521.60ft (110 Buildings)
- At 525.10ft (255 Buildings)
- At 526.20ft (308 Buildings)

Many of Montpelier's Valuable Historic Buildings are Located in the Most Flood-Vulnerable Area in City...

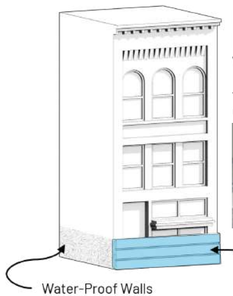
...Therefore, We Must Think Boldly and Creatively to Protect These Buildings.

DRY-PROOFING: Resists Water

WET-PROOFING: Absorbs Water and Reduces Harm

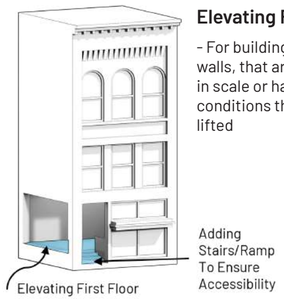
Installing Removable Flood Gates with Water-Proof Walls

- For Public and Major Commercial Buildings



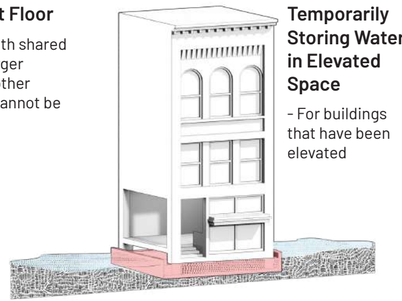
Elevating First Floor

- For buildings with shared walls, that are larger in scale or have other conditions that cannot be lifted



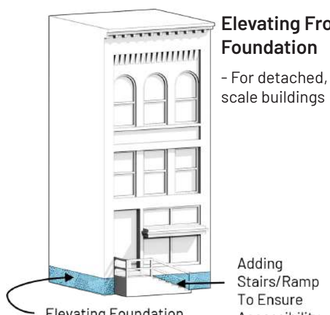
Temporarily Storing Water in Elevated Space

- For buildings that have been elevated



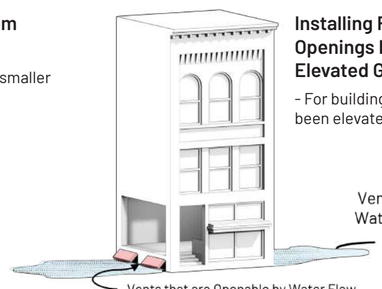
Elevating From Foundation

- For detached, smaller scale buildings



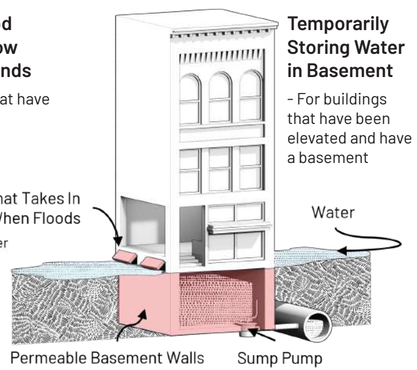
Installing Flood Openings Below Elevated Grounds

- For buildings that have been elevated



Temporarily Storing Water in Basement

- For buildings that have been elevated and have a basement



The **Cost of Those Strategies** depend largely on buildin type and scale. Still, wet floodproofing measures com with lowest cost. Dry floodproofing measures cost more especially for elevating buildings on existing foundations.

Construction Type	Existing Foundation	Measure	Retrofit	Relative Cost
Frame, Masonry Veneer, or Masonry	Crawlspace or Basement	Wet Floodproofing	Wet floodproof crawlspace to a height of 4 feet above lowest adjacent grade or wet floodproof unfinished basement to a height of 8 feet above basement floor	Lowest
Masonry Veneer or Masonry	Slab-on-Grade or Crawlspace	Dry Floodproofing	Dry floodproof to a maximum height of 3 feet above lowest adjacent grade	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Barrier Systems	Levee constructed to 6 feet above grade or floodwall constructed to 4 feet above grade	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Elevation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Relocation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Slab-on-Grade	Elevation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Slab-on-Grade	Relocation	Elevate on continuous foundation walls or open foundation	Highest
Frame, Masonry Veneer, or Masonry	Slab-on-Grade, Crawlspace, Basement, or Open Foundation	Demolition	Demolish existing building and buy or build a home elsewhere	Varies

FEMA. Homeowner's Guide to Retrofitting: Six Ways to Protect Your Home From Flooding. 3rd ed., Federal Emergency Management Agency, June 2014.

FEMA

Increased Cost of Compliance Program (ICC)

After-flood recovery, provide up to $30,000 in elevation, relocation, demolition, or floodproof projects.

FEMA

VERMONT

Vermont State Government

75% +

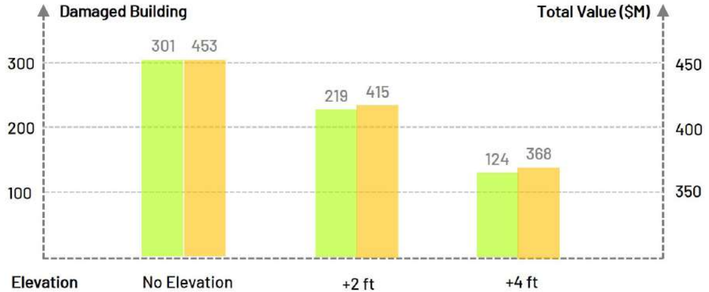
25% -

Hazard Mitigation Assistance Program (HMAP)

For buildings inside FEMA special flood hazard area (448 in Montpelier), generally eligible for constructions below $355,522.

A few **External Funding Options** will Help Montpelier's residents embrace change. In after-flood scenario, buildings that reported to have more than 50% of its original value damaged are eligible for the ICC program, which provides up to $30,000. In other cases, buildings inside FEMA Special Flood Hazard Area are eligible to apply for HMAP, which requires no additional cost-benefit analysis for construction cost lower than $355,522.

To visualize these strategies' impacts on Montpelier's buildings, here's a map illustrating the **Extent of Impacted Buildings Under the 2023 Flood Before and After Building Elevation**. If all buildings are elevated 4 ft from their adjacent grade, impacted buildings will reduce by two thirds from the status quo, while impacted total values will reduce by 20%.

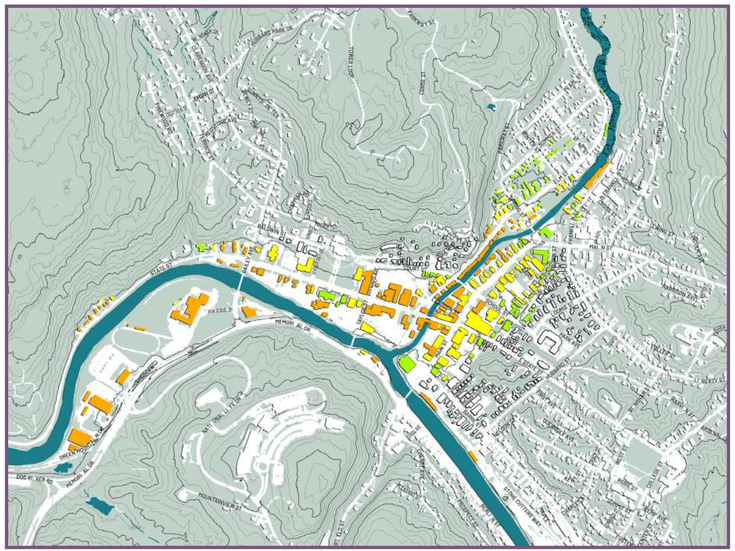


Data Source: Vermont Open Geodata Portal

- Undeveloped Land
- 160 — 20 ft Contour
- 5 ft Contour
- Undeveloped Land
- Water Bodies

Estimated Buildings at Risk

- No Elevation
- +2 ft From Adjacent Grade
- +4 ft From Adjacent Grade



Additionally, these flood mitigation strategies in buildings help to **Reduce Insurance Rates**.

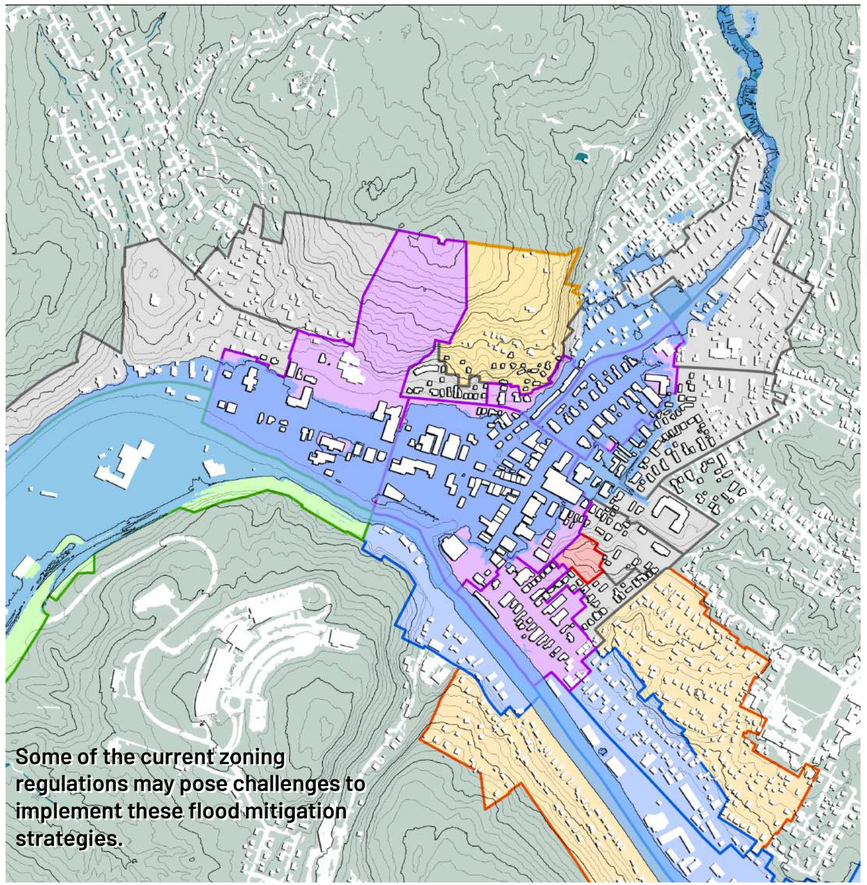
FEMA's new risk-rating system gives Montpelier a risk-based insurance cost nearly 300% of current cost, indicating potential surge in insurance cost in near future...

NATIONAL FLOOD INSURANCE PROGRAM

- Discount for Elevation
- Discount for Flood Openings (letting water flow by below building)
- Discount for M&E Upstairs
- Discount for Floor Numbers
- Discount for Increasing CRS (Community Rating System)

Illustration						
First Floor Height* (in Feet)	Slab on Grade	Basement	Crawlspace (including Subgrade Crawlspace)	Elevated with Enclosure Not on Posts, Piles, or Piers	Elevated with Enclosure on Posts, Piles, or Piers	Elevated without Enclosure on Posts, Piles, or Piers
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1	-8.0%	-8.0%	-8.0%	-8.0%	-9.0%	-10.0%
2	-15.4%	-15.4%	-15.4%	-15.4%	-17.2%	-19.0%
3	-22.1%	-22.1%	-22.1%	-22.1%	-24.6%	-27.1%
4	-28.4%	-28.4%	-28.4%	-28.4%	-31.4%	-34.4%
5	-34.1%	-34.1%	-34.1%	-34.1%	-37.6%	-41.0%
6	-36.7%	-36.7%	-36.7%	-36.7%	-43.2%	-46.9%
7	-39.3%	-39.3%	-39.3%	-39.3%	-48.3%	-52.2%
8	-41.7%	-41.7%	-41.7%	-41.7%	-53.0%	-57.0%
9	-44.0%	-44.0%	-44.0%	-44.0%	-57.2%	-61.3%
10 - 14	-46.3% to -54.4%	-46.3% to -54.4%	-46.3% to -54.4%	-46.3% to -54.4%	-61.1% to -73.3%	-65.1% to -77.1%
15 - 25	-56.2% to -70.9%	-56.2% to -70.9%	-56.2% to -70.9%	-56.2% to -70.9%	-75.7% to -86.6%	-79.4% to -88.9%

... By applying strategies such as elevation or installing flood openings, buildings can receive a substantial amount of flood insurance rate reductions.

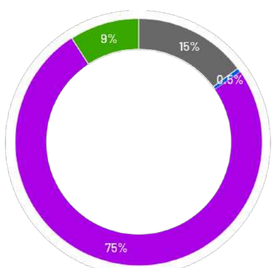


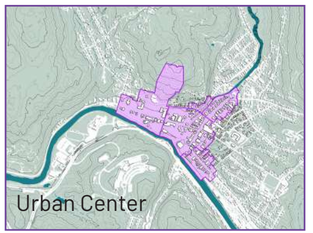
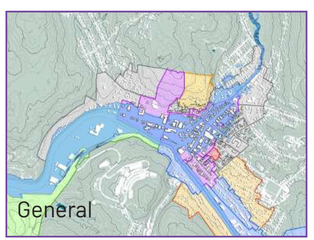
Data Source:
Vermont Open Geodata Portal

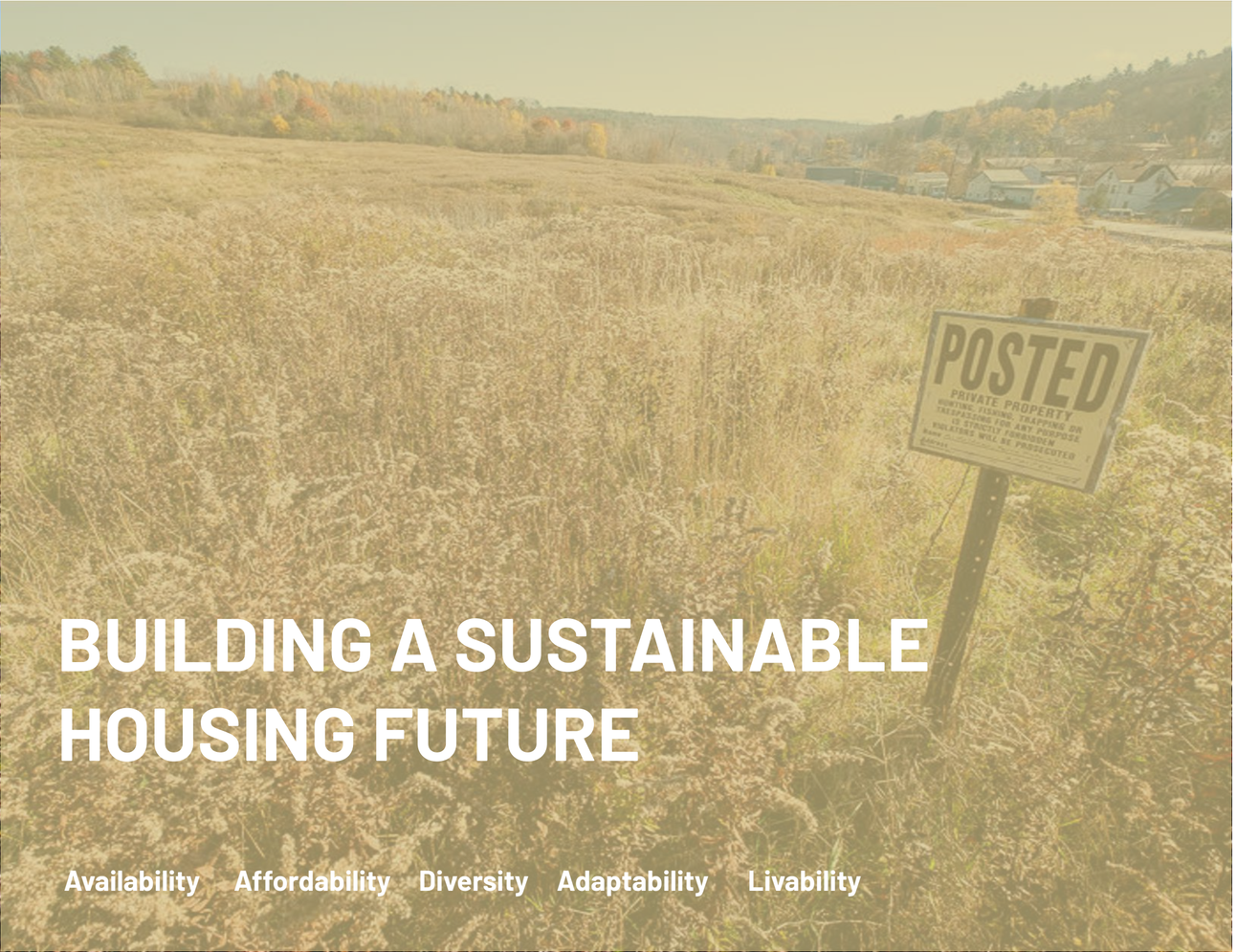
- Undeveloped Land
- 160 — 20 ft Contour
- 5 ft Contour
- Undeveloped Land
- Water Bodies

Zoning Districts

- Urban Center
- Mixed Use Residential
- Riverfront
- Western Gateway



Zoning District	Current Regulations	Consider Changing
 Urban Center	Street facing entrance should align to elevation of sidewalk for pedestrian accessibility	**Allow elevation difference**, Mandate accessibility for pedestrian, Encourage diversified design in promoting accessibility
	0-20 feet minimum setback from water; No riparian buffer required	Consider **setting at least 10 ft setback** for future and renewed developments, Waive implementation of green infrastructure in setback area, Encourage revegetation
 Western Gateway	No mandatory elevation required	**Mandate building elevation by at least 2ft**
 General	Sidewalks shall be at least 5 feet wide	**Effective sidewalk width** shall at least be 5 ft excluding any protruding structure like stairs/ ramps/porches

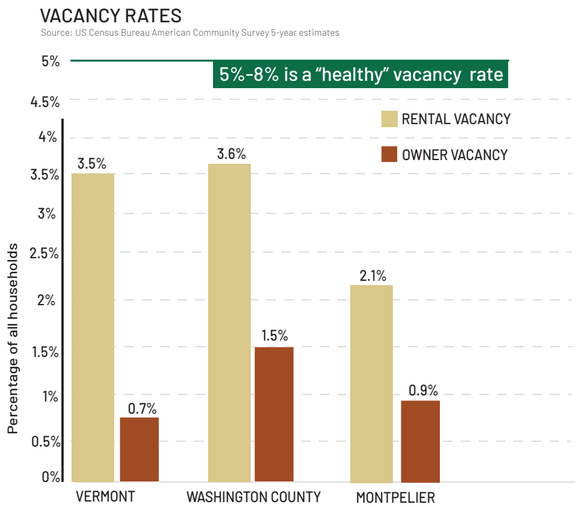


BUILDING A SUSTAINABLE HOUSING FUTURE

Availability Affordability Diversity Adaptability Livability

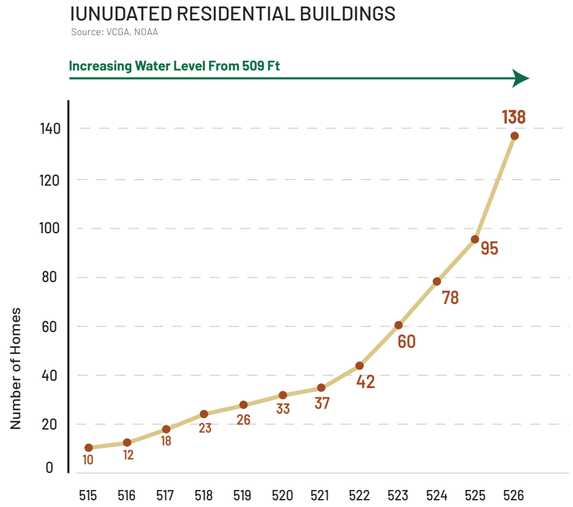
36,000 Homes Needed in Vermont

According to 2025 - 2029 Vermont Housing Needs Assessments



138 Houses Inundated in Montpelier

Based on the Flood Water Height in July 2023



The state currently requires approximately 36,000 homes to meet existing demand, with Montpelier experiencing **a housing vacancy rate well below the healthy threshold**. Compounding this issue, **more than 100 residential buildings** in Montpelier were inundated during the summer 2023 flood, further exacerbating the housing crisis by displacing residents and reducing an already limited housing stock. These challenges highlight the critical need for immediate and sustained efforts in Montpelier, and across Vermont, to expand housing supply while mitigating vulnerabilities to climate-related events.

Expand Developable Land

Look for additional low-lying areas wth slight and/or moderate slope for potential housing development; integrate recreational space, construct new roads and trails around the property to connect various developments

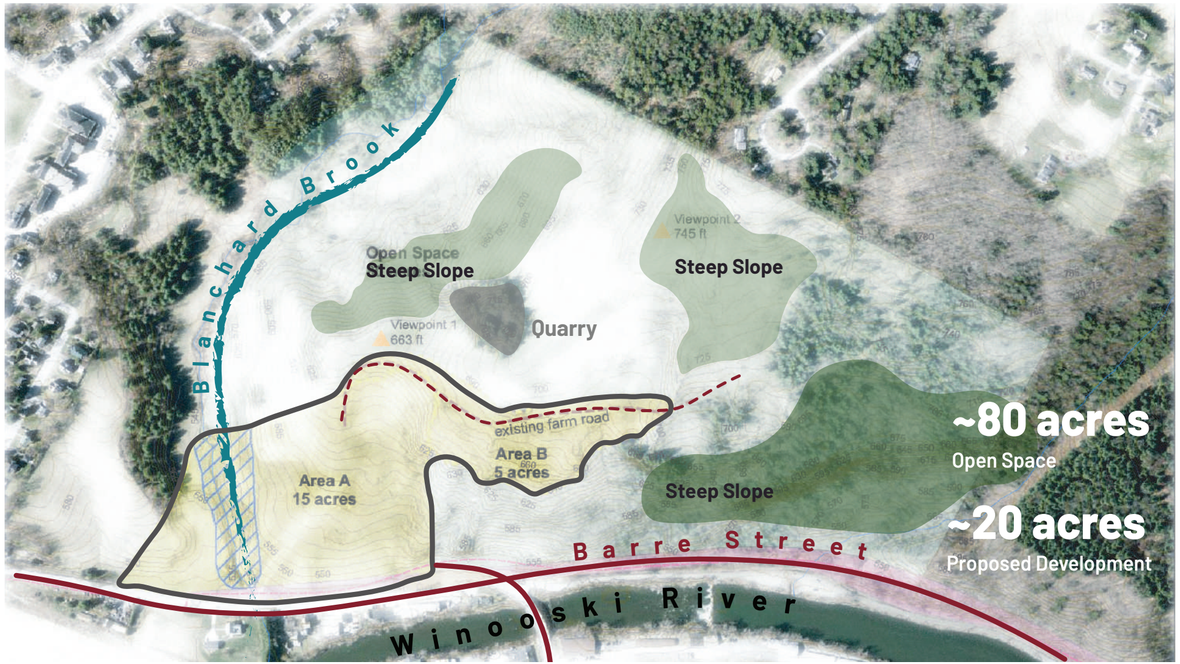
Manage Stormwater Runoff and Discharge

Re-vegetate areas with slope over 20%, direct storm water to open space, adopt drainage strategies to slow runoff.

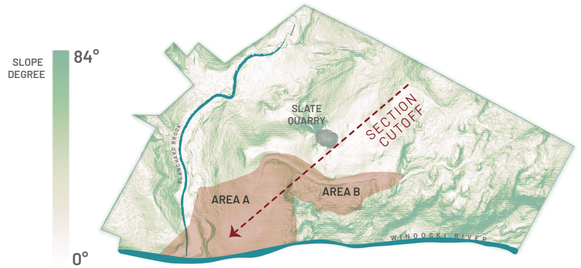
Increase Housing Units and Diversify Housing Types

Maximize building density at proposed area, prioritize diverse housing types, including affordable, multi-family, and senior housing while maintaining density aligned with Montpelier's existing neighborhoods.

New housing development efforts will be concentrated around **Sabin's Pasture** and the **Country Club Road sites** in Montpelier. This area comprises 240 acres of open space located to the east of downtown Montpelier. With a long history of housing development proposals, these sites provide a valuable foundation of ideas and insights to inform current planning and implementation strategies.

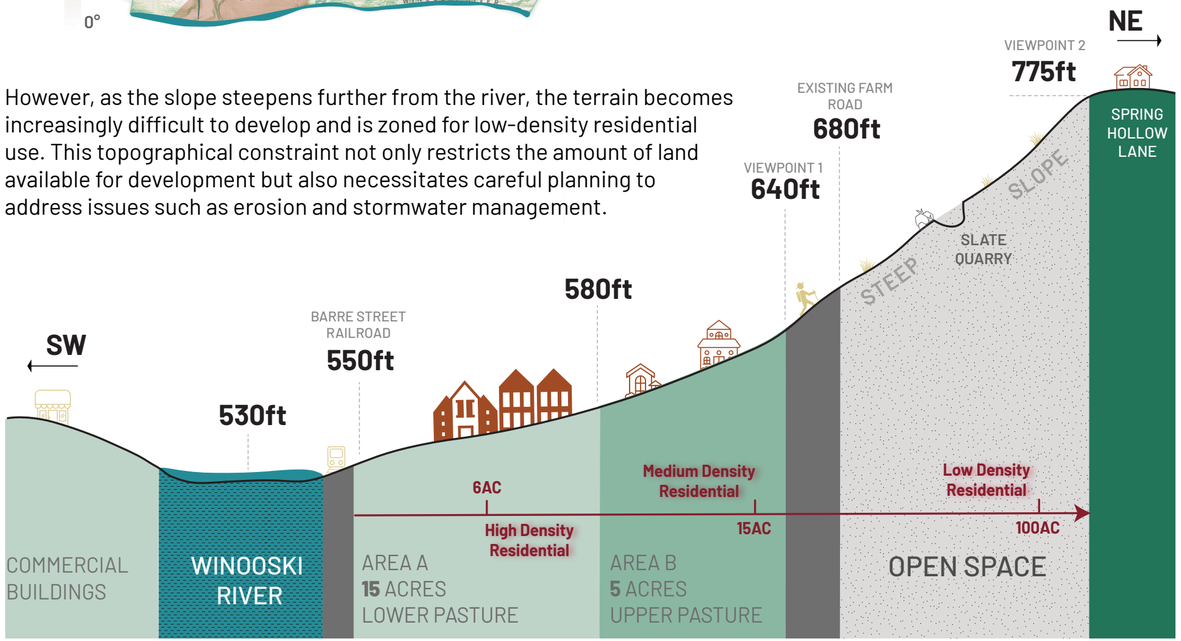


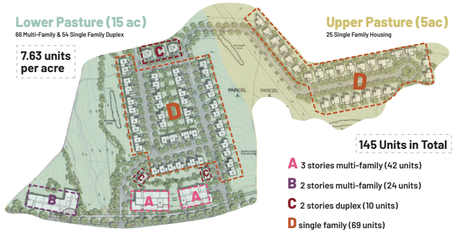
Sabin's Pasture encompasses a proposed development area of approximately 20 acres situated along the Winooski River, with the remaining 80 acres designated as open space. The site features the Blanchard Brook, a tributary of the Winooski River, running along its western edge. At the center of Sabin's Pasture lies an old slate quarry, which, although no longer in use, is characterized by surrounding steep slopes, presenting unique considerations for development and environmental management.



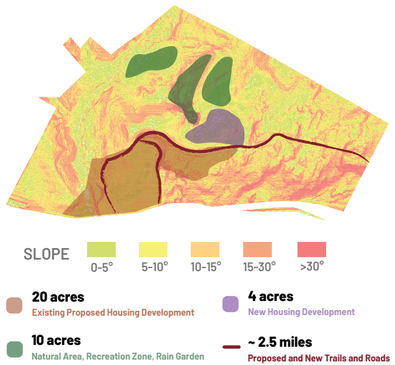
A significant challenge affecting development on both the Sabin's Pasture and Country Club Road sites is the presence of **steep slopes**. In Sabin's Pasture, the elevation rises sharply from 530 feet near the Winooski River to 775 feet at its highest point. The lower 50 feet of elevation, encompassing approximately **20 acres**, has been identified as **suitable for development**.

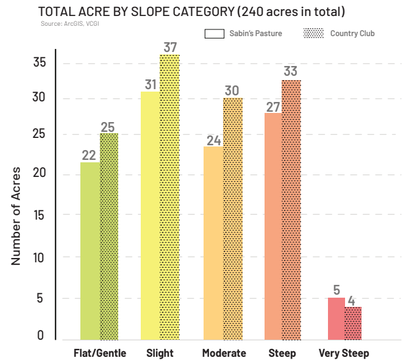
However, as the slope steepens further from the river, the terrain becomes increasingly difficult to develop and is zoned for low-density residential use. This topographical constraint not only restricts the amount of land available for development but also necessitates careful planning to address issues such as erosion and stormwater management.



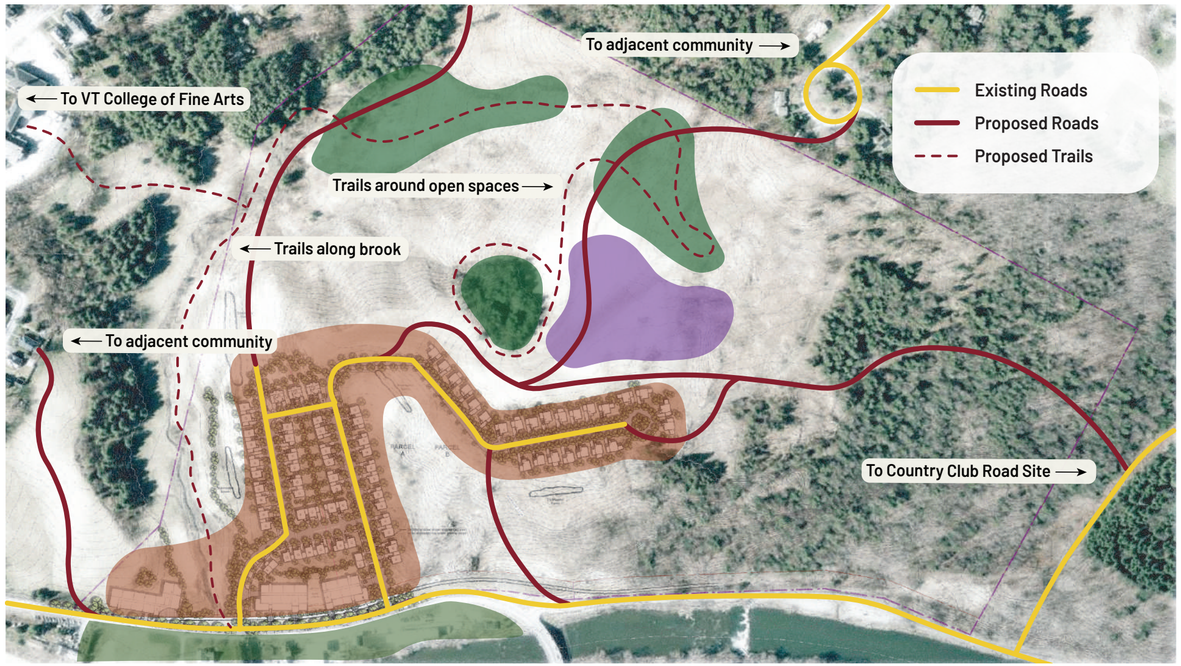


The **existing proposed plan** for the 20-acre developable portion of Sabin's Pasture divides the site into an upper and lower pasture, accommodating a variety of housing types. These include multi-family housing, duplexes, and single-family homes. The majority of the planned units are single-family houses, with a total of 145 units, yielding an average density of approximately seven units per acre.



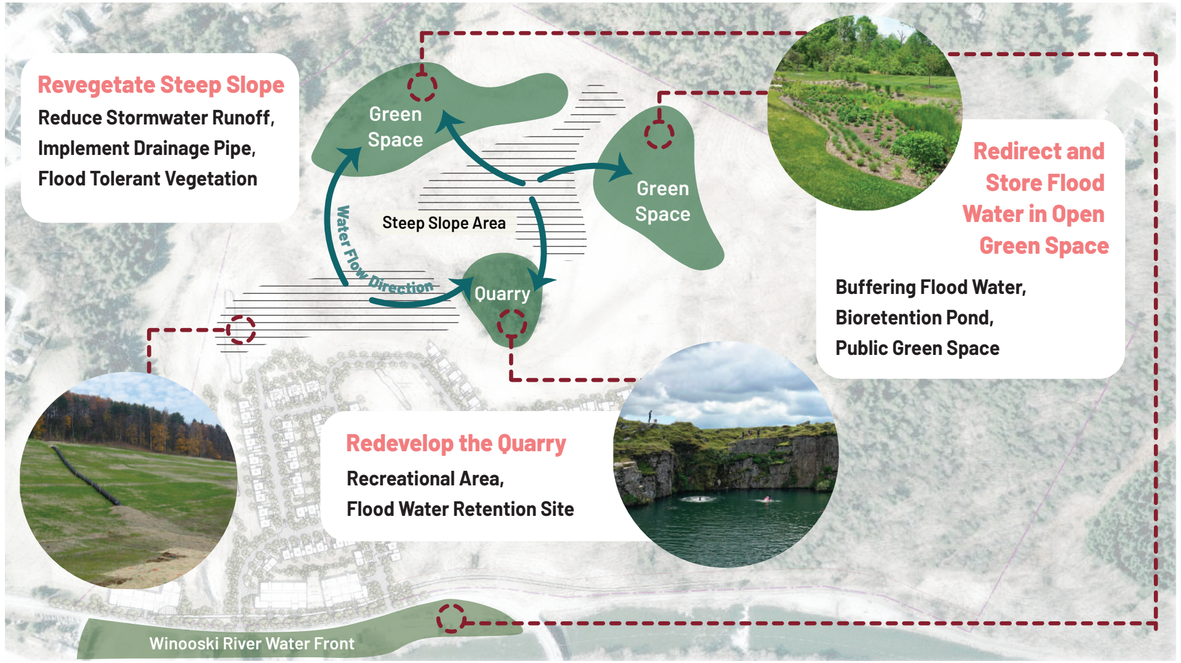


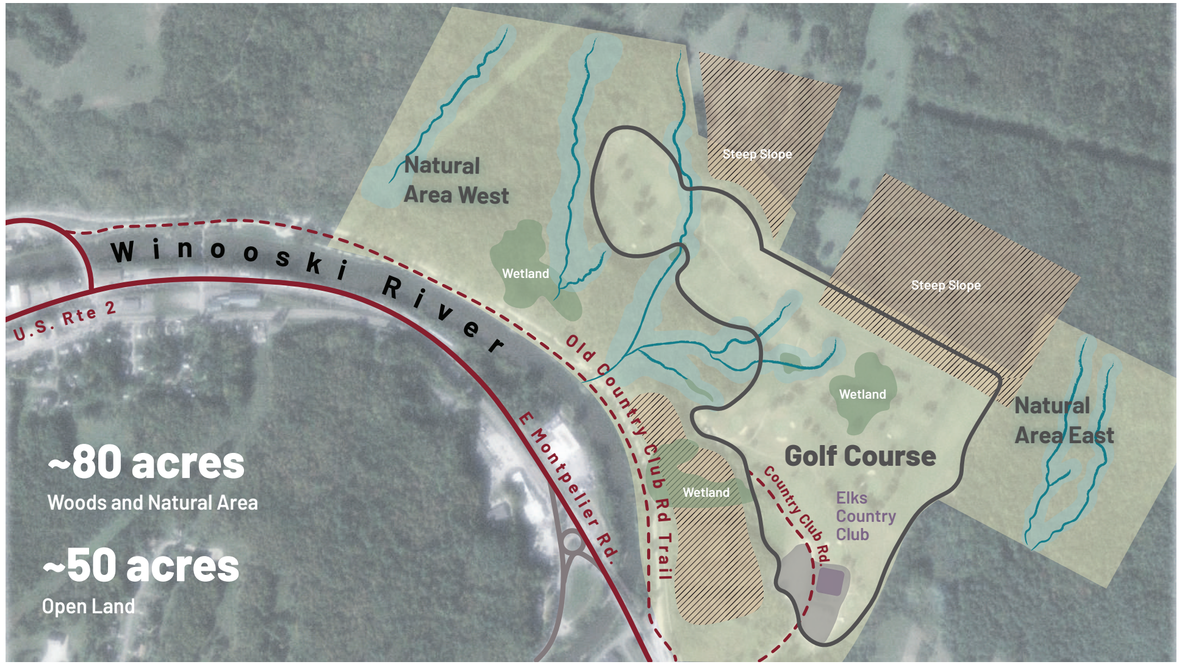
Of the total 240 acres of land, less than half—approximately 110 acres—has a slope of less than 10 degrees. Specifically, this includes about 30 acres at Sabin's Pasture and approximately 45-50 acres at the Country Club Road site. However, with slight modifications to the landscape, areas with slopes between 10 and 15 degrees also present potential for development. This adds an additional 40 acres at Sabin's Pasture and 35 acres at the Country Club site, providing more flexibility for development planning.



Through slope and elevation analysis, revisiting site plans, and reviewing planning documents, **an updated plan** for Sabin's Pasture has been developed. In the lower pasture, the density for multi-family living spaces will be raised from 7 to 15 units per acre, allowing for the construction of 120 townhome units. Additionally, 80 mixed-use, low-rise senior housing units will be built, with retail or community spaces on the ground floor and senior apartments on the upper floors. In the original upper pasture, the density will be slightly increased to 10 units per acre, enabling the construction of 45 attached single-family duplex units. For the newly proposed housing area to the north, space will be reserved for 16 single-family homes. areawithin the development.

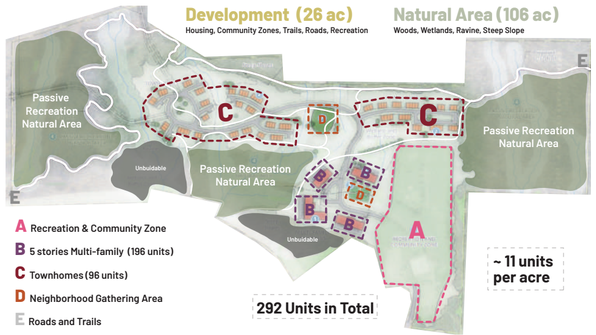
The proposed plan for Sabin's Pasture includes the **construction of new roads** that will connect the development to the adjacent community, the nearby Vermont College of Fine Arts, and the Country Club Road site. Additionally, **a network of trails** will be built to traverse the open spaces, extending along the Blanchard Brook. This infrastructure will enhance accessibility, promote connectivity, and provide residents with opportunities for recreation and engagement with the natural environment.



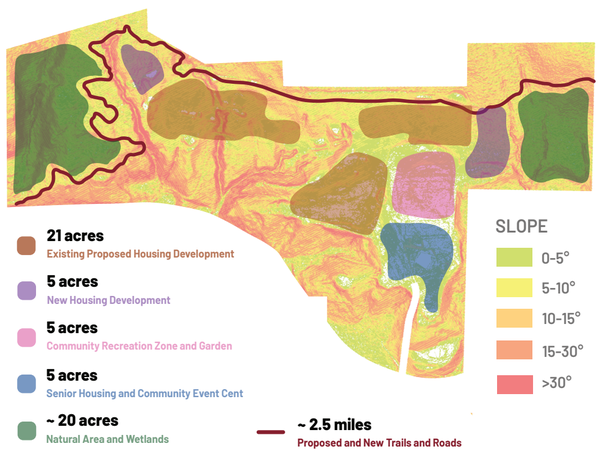


To **enhance open green space and manage environmental concerns**, we propose several measures for Sabin's Pasture. The steep slopes in the western part of the site, which are located near the housing development, will be revegetated to help reduce runoff velocity and prevent erosion. Additionally, drainage pipes will be installed to redirect stormwater toward nearby open spaces. The old quarry on Sabin's Pasture will be repurposed as a recreational area that also serves as a water retention site during periods of intense rainfall, transforming a previously underutilized feature into a functional and community-oriented space. Furthermore, stormwater from the steep slopes will be redirected to lower-lying open spaces, which will include bio-retention ponds designed to manage runoff effectively. These green spaces

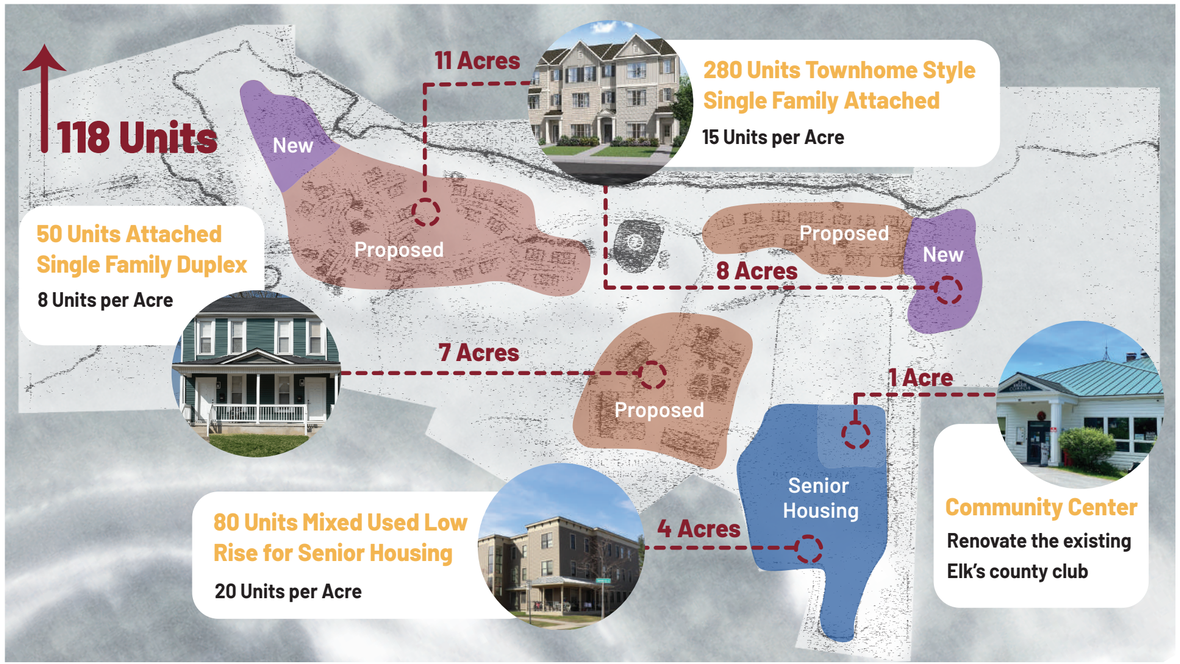
The Country Club Road site features a more complex topography than Sabin's Pasture, characterized by steep slopes, wetlands, and deep ravines. Previously used as a golf course, the site includes the Elks Country Club building. The golf course itself covers approximately 50 acres of open land, while the remaining 80 acres consist of wooded natural areas. This varied landscape presents both opportunities and challenges for development, requiring careful consideration of environmental factors and land use.



The existing proposed plan for the Country Club Road site designates 26 acres for development, with the remaining 100 acres preserved as natural areas. The development includes a mix of multi-family buildings and townhomes, totaling 292 housing units, resulting in an average density of approximately 11 units per acre. In contrast to the plan for Sabin's Pasture, the Country Club Road plan incorporates designated zones for recreation and community activities, neighborhood gathering spaces, and an integrated network of roads and trails, enhancing both connectivity and the quality of life for residents.

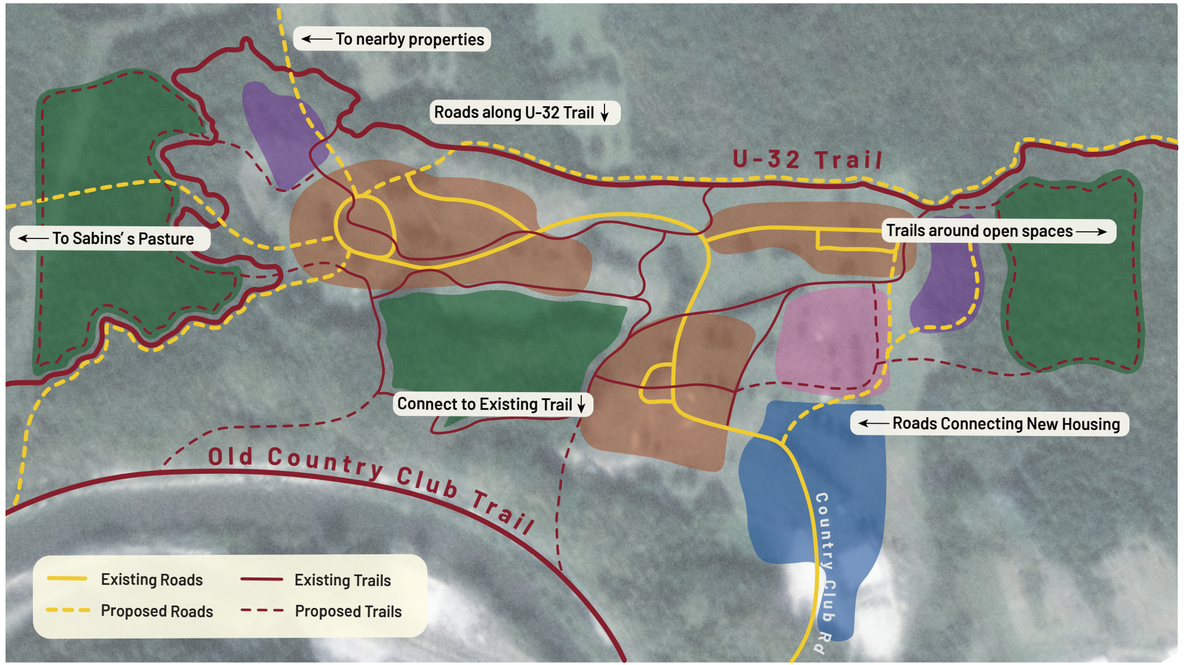


The new plan for the Country Club Road site involves extending the 20 acres of proposed housing development by an additional 5 acres, highlighted in purple. The original 10-acre parcel, which currently hosts the Elks Country Club and its parking lot, will be divided into two 5-acre sections. One section will be transformed into a community recreation zone and garden, providing shared green space for residents, while the other will be developed into senior housing. The Elks Country Club building will be repurposed as a community event center, supporting social and cultural activities. To improve connectivity within the site, 2.5 miles of new trails and roads will be constructed, linking the natural areas, recreational spaces, and housing developments.

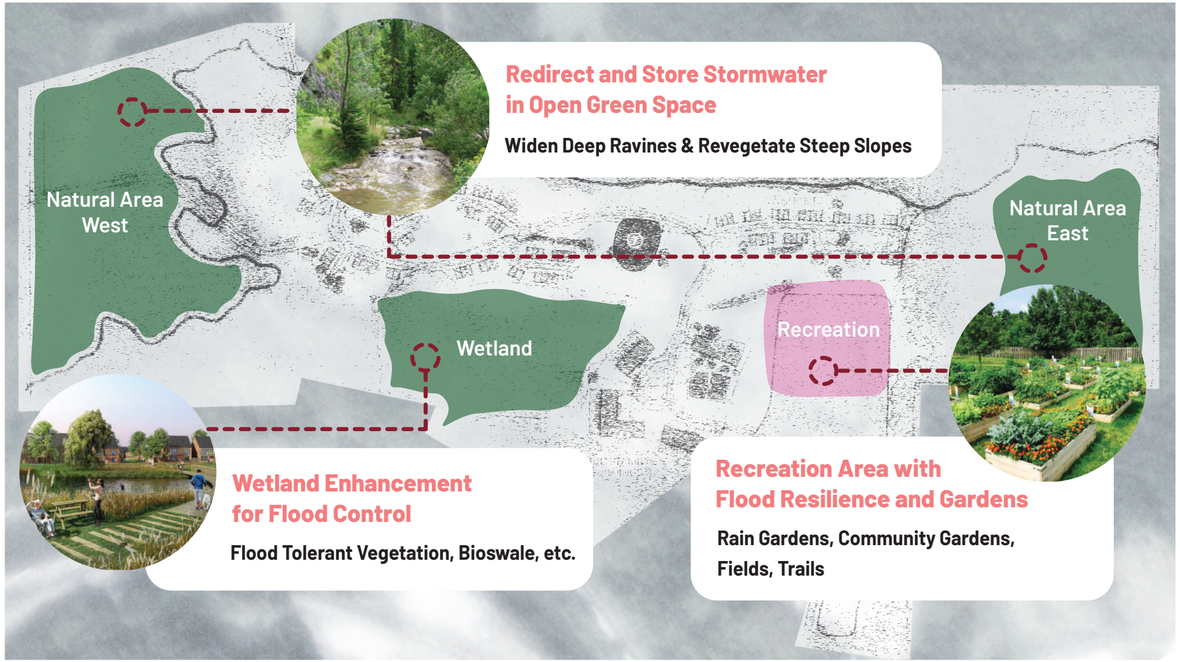


The housing plan for the Country Club Road site includes the extension of the proposed housing areas and an increase in building density, in alignment with the approach taken for Sabin's Pasture. This will enable the development of approximately 280 townhome-style single-family attached units, with 50 attached single-family duplex units and 80 units of senior housing.

In General, following the original proposed plan (+440 units), Montpelier would grow by 13%, which is approximately 1,000 residents. While following our updated plan (+660 units) Montpelier would grow by approximately 1,500 residents - a 19% jump while providing 5 acres of new recreation open space designed to manage and slow rainwater before reaching the river.



The plan includes the **development of additional trails** that will loop around open spaces and wetlands, improving access to natural areas. These new trails will connect to the proposed U-32 Trail and the existing Old Country Club Trail, enhancing connectivity within the site and to surrounding areas. As the housing areas are extended, the existing road plan will be expanded to accommodate increased traffic and improve access. Additional roads, indicated by dashed lines in the plan, will link the site to Sabin's Pasture, nearby properties, and newly developed housing areas, while also running alongside the trails. This network of roads and trails will facilitate movement throughout the site and strengthen the connection between residential, recreational, and natural spaces.



The plan for the Country Club Road site includes **redirecting stormwater to open green spaces**, where it can be absorbed and controlled without impacting residential areas. Specifically, we propose widening the deep ravines found throughout the property to help manage runoff and enhance water flow. For the wetlands, flood-tolerant vegetation will be planted, and bioswales will be incorporated to improve flood control and water filtration. Additionally, the designated recreation area will serve a dual purpose, functioning as both rain gardens and community gardens. This integration of environmental functionality with spaces for community engagement and leisure will support sustainable stormwater management while creating valuable areas for residents to gather and enjoy outdoor activities.

05

SUMMARY

TABLE OF CONTENTS

Endnote

We are excited about the idea that a strategic plan like Montpelier Strategic Plan: A Vision for Growth, Preservation, and Resilience could help tackle how downtown Montpelier evolves into a vibrant, sustainable, and adaptive community. This plan represents a thoughtful effort to balance growth with preservation and resilience, addressing critical challenges while honoring the city's unique character. While the interventions we presented cannot stop floods from happening, they can make downtown Montpelier better prepared to withstand the next flood and recover more quickly. And during the times when flooding does not occur, the same strategies can create a more vibrant, livable, and thriving downtown for all.

It is our hope that this work sparks meaningful dialogue and inspires actionable solutions. We look forward to receiving feedback on our work, as collaboration and diverse perspectives are essential to shaping a stronger, more resilient Montpelier.

Thank you for taking the time to review our plan!

Work Cited

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