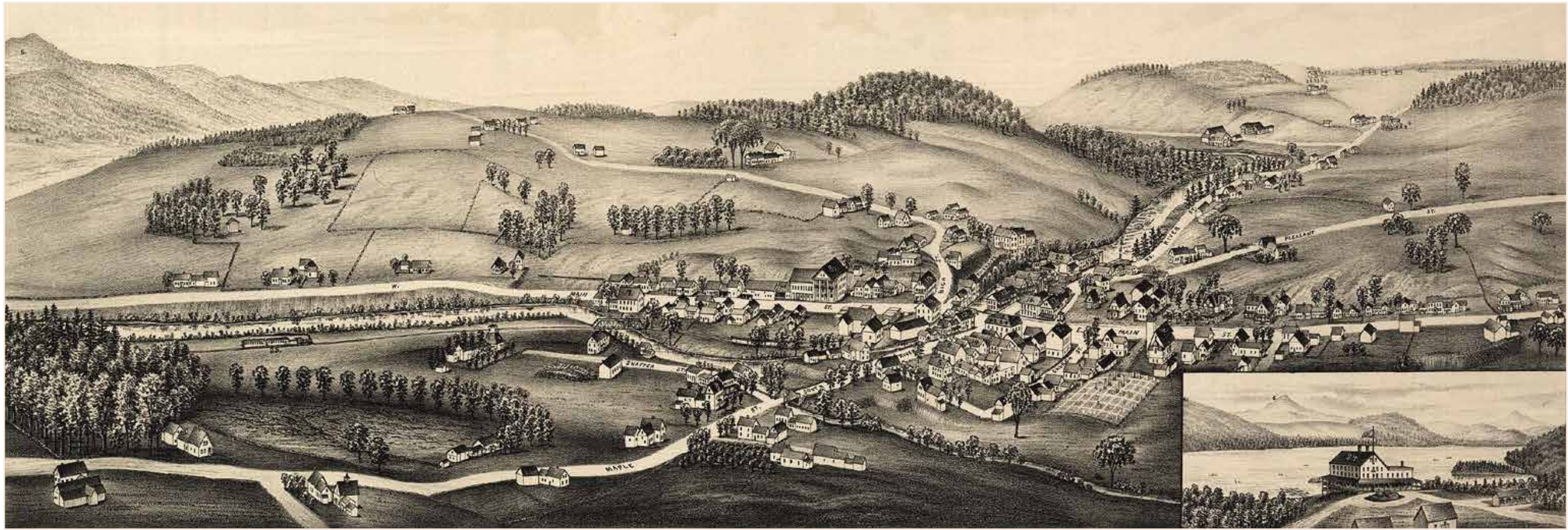




VILLAGE MASTER PLAN FOR WILMINGTON, VERMONT

Renee LaGue
Kimberly Smith
Spring 2013
Conway School of Landscape Design
332 S. Deerfield Rd. Conway, MA 01341



WILMINGTON, VERMONT, 1891

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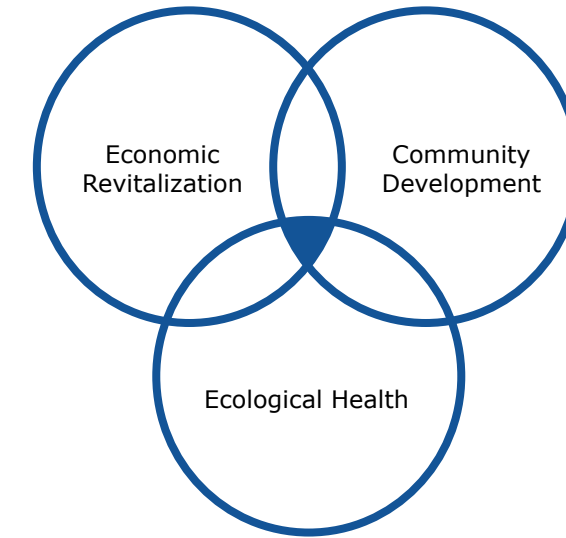
WILMINGTON VILLAGE MASTER PLAN



The Vermont House is one of Wilmington's landmark buildings.



The village center has hugged the banks of the North Branch of the Deerfield River since 1833. Some buildings along the river no longer exist due to flooding or other causes.



A Changing Townscape

Although the historic structures of Wilmington's village center have an air of timelessness, the village is constantly changing, both through human intervention and natural processes.

Before 1833, the town was located half a mile to the northeast, on Lisle Hill. When the Brattleboro-Bennington turnpike (current Route 9) was constructed, the village relocated in order to gain access to the turnpike and the water power of the Deerfield River. All structures except the meeting house were moved.

In August 2011, Tropical Storm Irene inundated the area with rain and the Deerfield River rose twenty-seven feet in the village center, causing destruction to buildings and a loss of one life. The community banded together to offer support to its members and rebuild some of the structures damaged by the flood. While the town had seen previous large floods in 1927, 1936, 1938, 1973, and 1976, the 2011 flood was the first large flood in thirty-five years and served as a reminder of the village center's vulnerability.

The town relies heavily upon a tourist economy created by traffic generated by Mount Snow Ski area to the north, travelers crossing east and west over the Green Mountains, and second homeowners, who own 52 percent of homes in town. In addition to financial difficulties associated with the flood recovery effort, the town is struggling to recover from the economic downturn of 2008. Today, many buildings are vacant or in disrepair.

Wilmington is in a very challenging position. The town is caught between wanting an attractive, vibrant downtown and knowing that there is a constant threat of economic devastation through future flood events. While economic revitalization is a top priority for many community members, it will be very difficult to have an economically thriving village center as long as it is located in the floodplain for a number of reasons.

- Banks are disinclined to finance construction, renovations, or offer mortgages within the floodplain.
- It is difficult to find business owners willing to take on the risks of buying or renting a building in a floodplain.
- FEMA regulations greatly restrict future development in the floodplain. If construction is approved, there are additional costs associated with building and renovating to meet floodplain zoning standards.
- Flood insurance adds an additional burden on landowners. FEMA is reportedly raising rates.
- Investments are threatened by physical and economic devastation.

As the town evaluates its situation and begins to make decisions about how to use its limited resources, there are some questions worth considering.

How can the community honor the past while moving into a sustainable future?

How can the community enhance its traditional village form while addressing the critical issue of flooding?

How can beautification strategies reduce flooding or be designed to withstand flooding?

Project Goals

This master plan strives to integrate economic revitalization, community development, and ecological health, each of which is critical to the long-term sustainability of Wilmington, by recommending ways to:

1. Promote development outside the flood zone.
2. Reduce the effects of minor flood events, filter stormwater runoff, and enhance ecological systems.
3. Create inviting, pedestrian-friendly streetscapes.
4. Revitalize existing public parks and create new ones.
5. Calm traffic and define parking areas and spaces.

Process

This village master plan was developed by a team of students from the Conway School. The students held four meetings, including two public community meetings, in order to determine the community's vision for the village and to hear feedback on preliminary designs.

GEOGRAPHIC CONTEXT

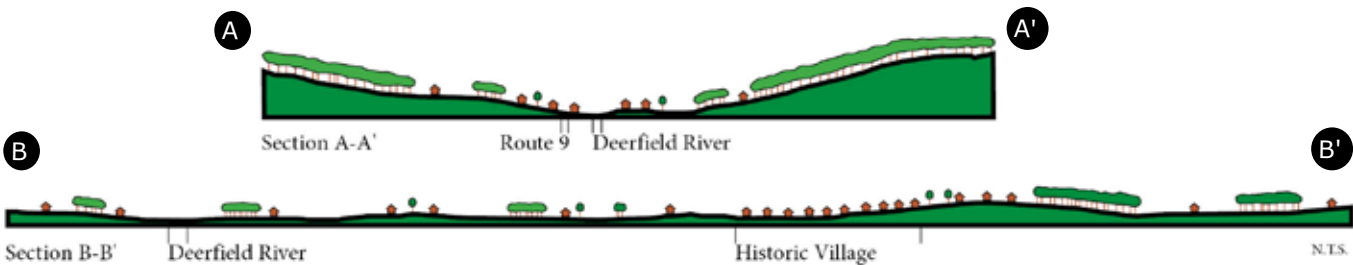


The village of Wilmington is nestled in the Deerfield River Valley just to the east of the Green Mountain National Forest in southern Vermont. The town is located about 20 miles from both Bennington and Brattleboro on Route 9, which is the major east-west route through southern Vermont.

Route 9 is the village's main street and as a result, the village center sees a lot of truck traffic, noise, and exhaust fumes.

Route 100, which leads north to the Mount Snow Ski Area, intersects with Route 9 in the village. Many tourists arrive from the south on Interstate 91 through Brattleboro, drive west on Route 9, and then turn north on Route 100.

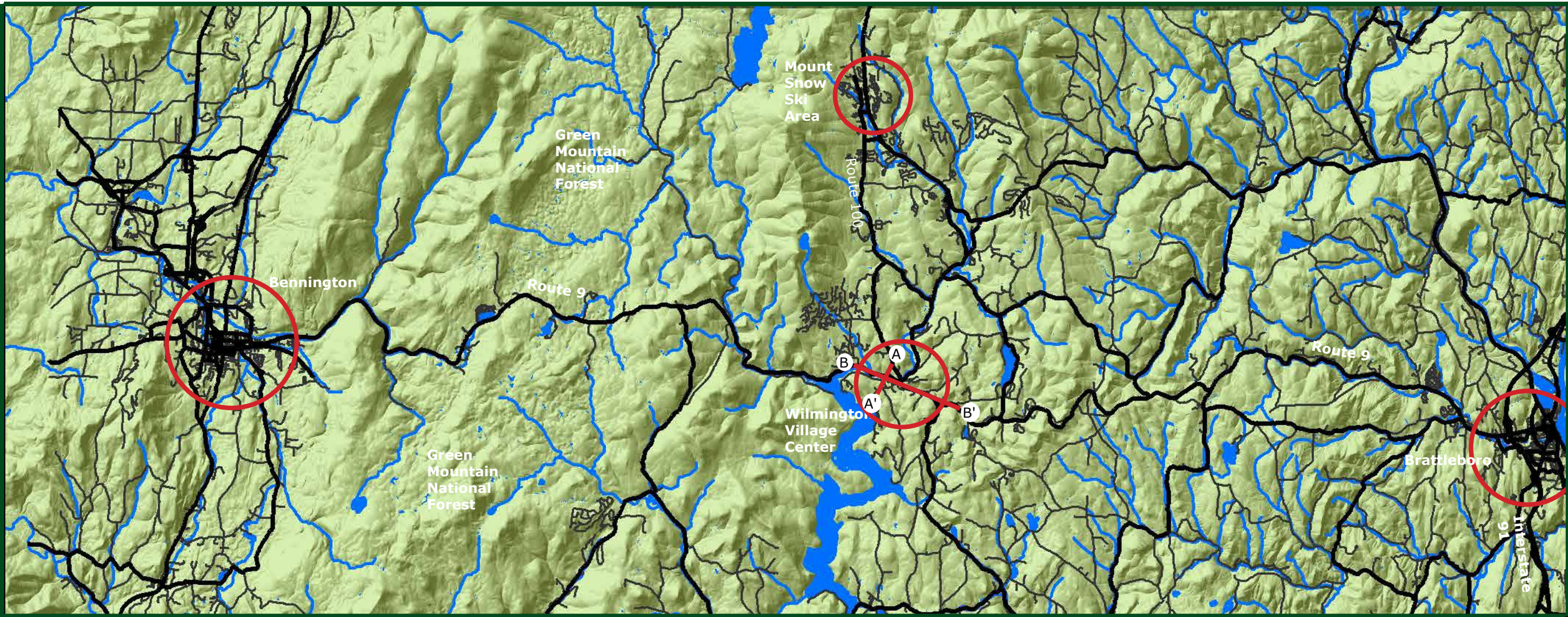
The topography surrounding Wilmington is steep and rocky, causing water to run off quickly into the rivers and rush along the valley floor, particularly during large rain events and during the spring thaw and snowmelt.



Wilmington from a nearby hill. (Photo: Town Website)



Green Mountains in fall. (Photo: Tiido Tennelo)



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1 All through traffic on Routes 9 and 100 passes through this intersection.



2 The bridge is the only vehicle route across the Deerfield River in the village center.

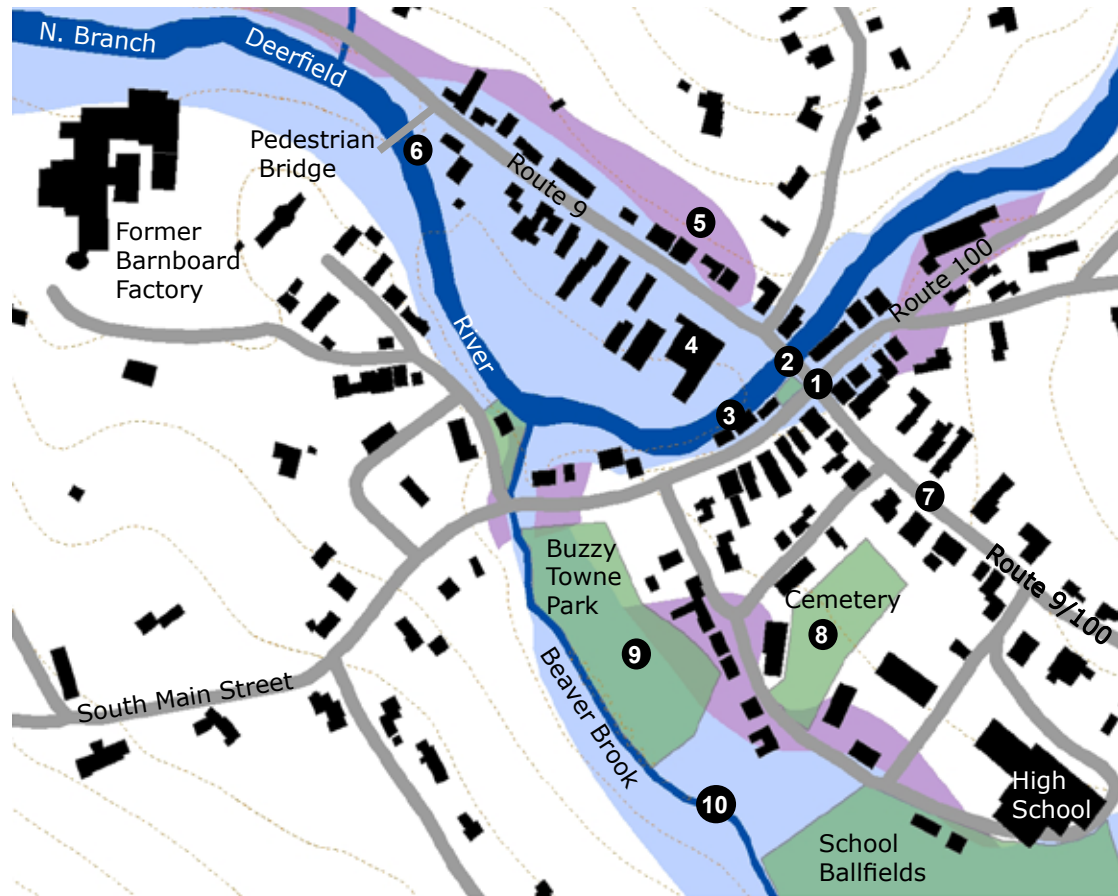


3 The backs of buildings overhang the Deerfield River. Banks are channelized in part of town.



4 Crafts Inn is one of the larger structures in the village and is located at its center.

EXISTING CONDITIONS



Legend

- Building Footprints
- Streets
- 20-Foot Contour
- Public Spaces
- Waterway
- 100-Year Floodplain
- 500-Year Floodplain

0 125 250 500 Feet



The state-designated downtown area is around 24.5 acres in size.

State Highways 9 and 100 bring heavy traffic through the village center.

Roughly half of the village center, including about fifty buildings, is in the floodplain.

Buildings are densely clustered around the main intersection and along Route 9. This density dissipates quickly as one moves away from the center.

Most streets radiate out from the central intersection. There are few distinct blocks.

One vehicle bridge spans the Deerfield River and one spans Beaver Brook.

A new pedestrian bridge provides a river crossing on the northwestern side of town.

Buildings face streets with their backs toward the river and brook.

The largest structures are Crafts Inn in the heart of the village, the high school, and former industrial buildings on the outskirts of town.



7 There are three historic churches within the village center.



8 The cemetery is beautiful and peaceful but is hidden behind a block of buildings.



9 Buzzy Towne Park consists of a baseball field, basketball court, and picnic table.



10 Beaver Brook has vegetated banks bordered by mowed ball fields to the north.

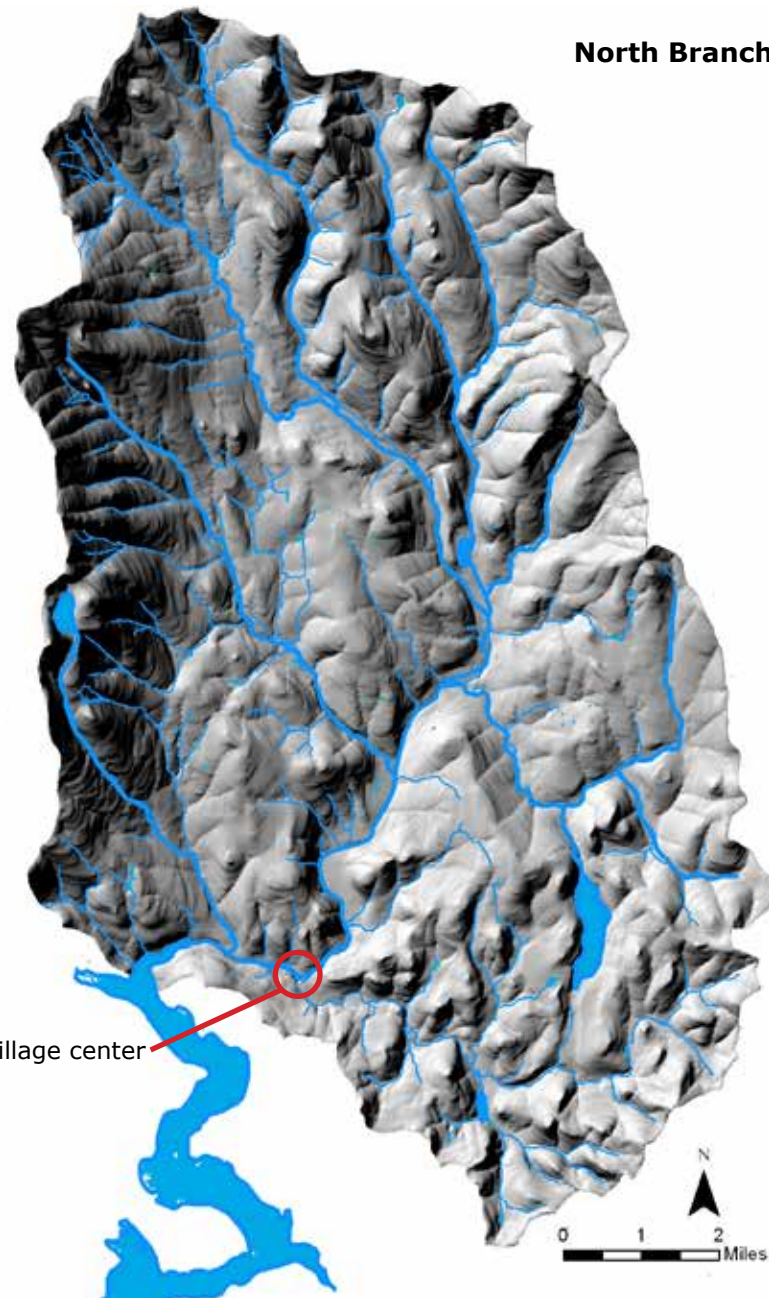


5 The Vermont House is a large historic building. Once an inn, the building is now vacant.



6 The new pedestrian bridge provides access across the river. It will connect by rail trail to Harriman Reservoir.

WATERSHED ANALYSIS



North Branch of the Deerfield River

"The North Branch of the Deerfield River flows through a highly cleared and disturbed watershed with ski area development, parking, hotels, houses, condominiums, subdivisions, driveways, and shopping centers." (Vermont Watershed Management Division)

Wilmington village center

Observations

- Wilmington is situated near the base of the 55.9-square-mile watershed of the North Branch of the Deerfield River (The Commonwealth of Massachusetts, Executive Office of Environmental Affairs).
- Most of the runoff from this watershed flows down the Deerfield River and passes through the village center.
- The slopes of the Green Mountains are steep, causing water to run off quickly during large storm events.

Implications

- A vast quantity of water passes through the village center during large storm events.
- Because land use upstream, such as the construction of impervious surfaces, deforestation, and the filling of wetlands, affects the rate and intensity of runoff, flood mitigation should be addressed upstream as well as within the village.

RESPONDING TO CHANGE

Climate Change

Meteorological systems, by their nature, are dynamic. However, global climate change is occurring at an unprecedented rate. Global temperatures have been on a warming trend since 1970 and leading scientists state that it is "very likely" (greater than 90% certainty) that this warming is caused by human activities, most notably the burning of fossil fuels (Northeast Climate Impacts Assessment).

The impacts of climate change are significant. For each decade since 1970, the northeastern region of the United States has seen a rise in average temperature of nearly a half degree Fahrenheit, with winter temperatures warming 1.3°F. In the next few decades, average winter

temperatures are projected to increase 2.5 to 4°F, with summer temperatures increasing 1.5 to 3.5°F above average historical records. These trends will result in hotter summers with a potential tripling of days each year above 90°F. Winters are becoming shorter with more precipitation falling as rain than as snow, resulting in a smaller snowpack and a less reliable ski season, which could negatively affect Wilmington's economy. In the northeast, climate change is expected to increase the frequency and severity of storms (Northeast Climate Impacts Assessment). An increase in storm severity could bring more frequent flooding to Wilmington's center.

Flood Response Strategies

Any community within a floodplain has three strategies for responding to its situation: accommodation, protection, and retreat. These strategies may be used together or alone.

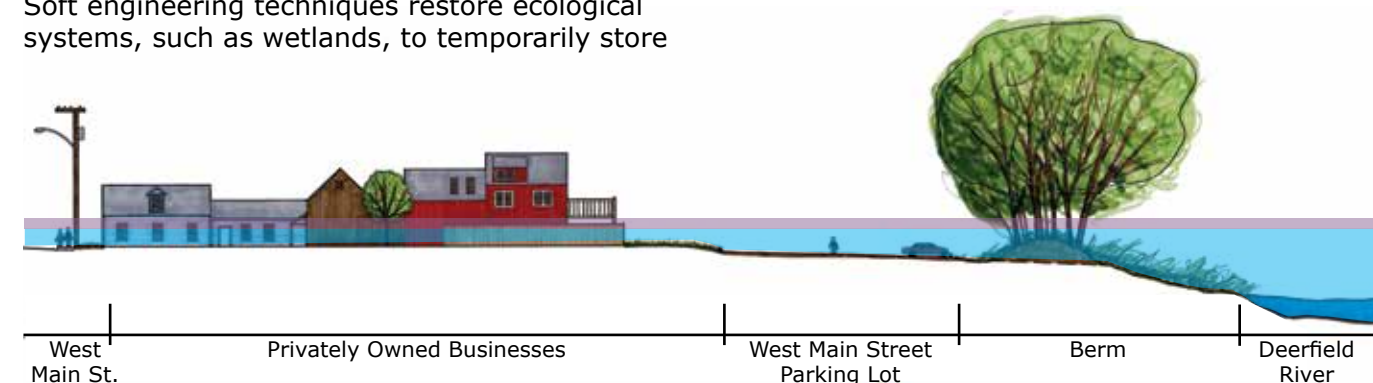
Accommodation is the process of armoring structures to reduce future flood damage. Some common practices include elevating buildings, floodproofing the lower floors, and elevating the utility system infrastructure.

Protection is the use of hard or soft engineered systems to prevent floodwaters from reaching the structures. Hard engineering, including dams and levees, is usually costly, is never fail-proof, and may be ecologically damaging. These barriers tend to exacerbate the effects of flooding elsewhere by preventing the storage of water in the floodplain.

Soft engineering techniques restore ecological systems, such as wetlands, to temporarily store

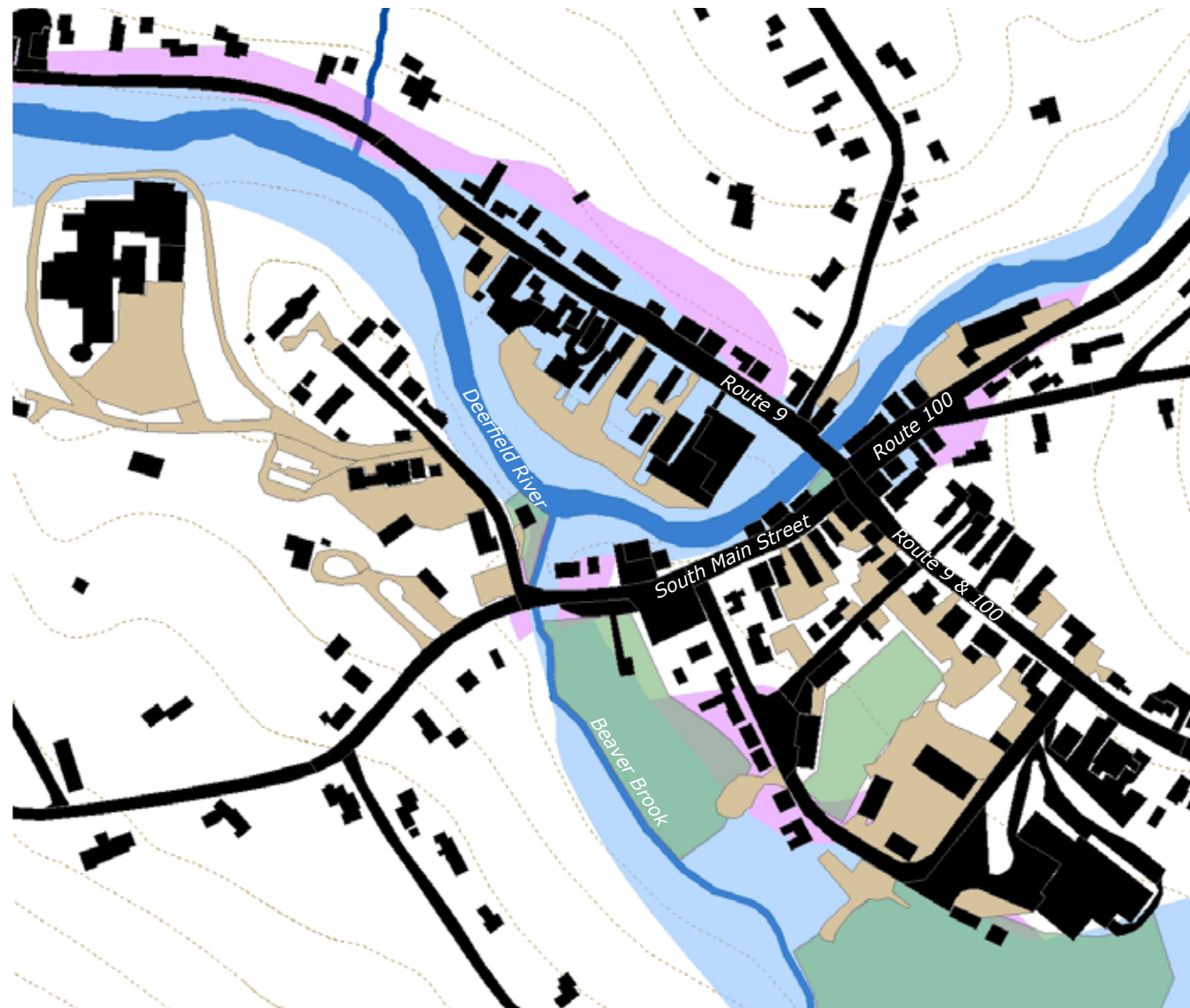
floodwaters. These systems are less expensive, less prone to failure, and improve rather than damage ecological systems. Installing soft engineering upstream of the village could help reduce the intensity of floods. Although protection strategies can reduce flooding, it is unlikely that they will effectively protect Wilmington from large storm events.

Retreat is the process of moving physically out of the floodplain, allowing the floodplain to function naturally. This is by far the most effective method of avoiding the social consequences of flooding, although it may have a high upfront cost (The City of New York). As Tropical Storm Irene demonstrated, flooding is economically devastating. Unless the threat of flooding is effectively addressed, it will be very difficult for a community to create long-term economic sustainability.



Section of West Main Street shows the approximate flooding for 100-year (blue) and 500-year (purple) floods. Note: Section is based on a twenty-foot contour. A survey would be needed to check the accuracy of slopes.

FLOODPLAIN ANALYSIS



Legend

- Asphalt
- Hardpacked Surfaces
- 100-Year Floodplain
- 500-Year Floodplain
- Waterway
- Public Spaces
- 20-Foot Contour

Observations

- Roughly half of the area within Wilmington's village center is located within the floodplain.
- Around 50 buildings are in the floodplain.

Implications

- Because floodplains provide water storage during storm events, the village center will continue to flood.
- Increased storm frequency and severity associated with climate change may cause increased flooding in the future.
- Within the village center, opportunities exist to mitigate small floods by converting impervious surfaces to pervious ones and increasing water storage in public spaces.

Wilmington experienced major floods in 1927, 1936, 1938, 1973, 1976, and 2011.



The bridge over the Deerfield River was damaged by the 1938 flood and rebuilt. Dots Restaurant is located to the left of the bridge.



In 1938, Dot's was partially protected from flood damage by two buildings upstream, which no longer exist.



In 2011, Dot's Restaurant was seriously damaged during Tropical Storm Irene. (Photo: Eric Craven)



After the 2011 flood, the community raised \$600,000 to elevate the building and help mitigate future flood damage. (Photo: Patty Reagan)

What is a Flood Zone?

A 100-year floodplain theoretically means that in any given year, there is a one percent chance that the designated area will flood. However, flood zone categories are based on statistical averages and are misleading because flooding patterns are irregular. Additionally, flood zone designations are based on limited historical data and climatic conditions are constantly shifting (US Geological Survey).

Current Floodplain Zoning in Wilmington

Development within the one-hundred-year floodplain is prohibited if it displaces water. Further, all new structures must be elevated to above base flood elevation or be watertight and resist flood forces (Town of Wilmington Flood Hazard Regulations).

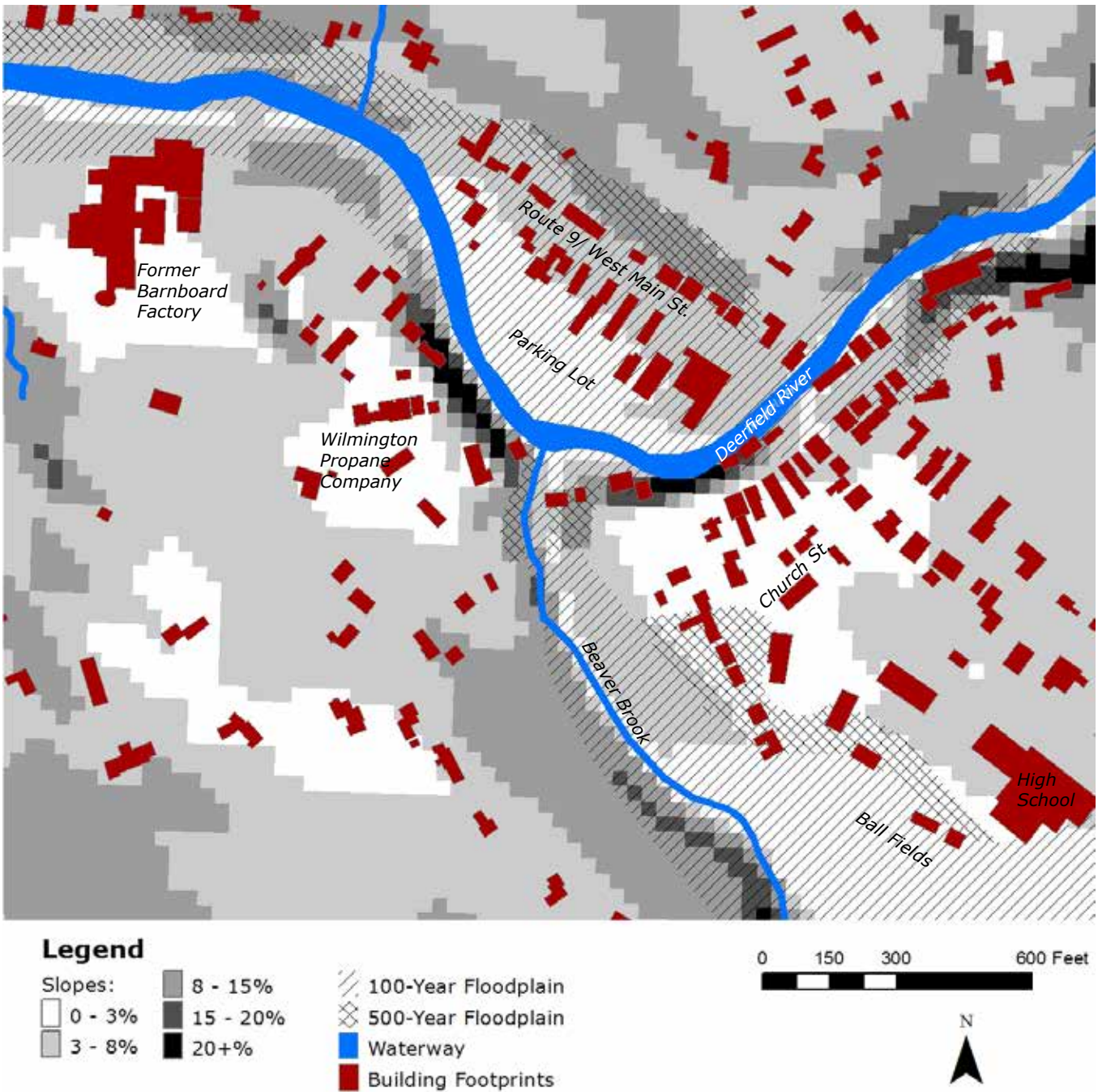
Historic buildings in Wilmington do not have to meet the requirements of the National Flood Insurance Program and may be more easily rebuilt than newer buildings if they are substantially damaged by floods (FEMA).

The Costs of Living in a Floodplain

An average single-story American home will typically experience \$14,000 worth of damage in a one-foot flood. The same home in a three-foot flood will sustain an average of \$27,000 in property damages (Flood Safety).

There is more than a 25 percent chance that a home within the 100-year floodplain will experience a flood during the typical 30-year mortgage (Flood Safety). With the risks so high, most banks require flood insurance and they may decline to provide a mortgage altogether.

SLOPE ANALYSIS



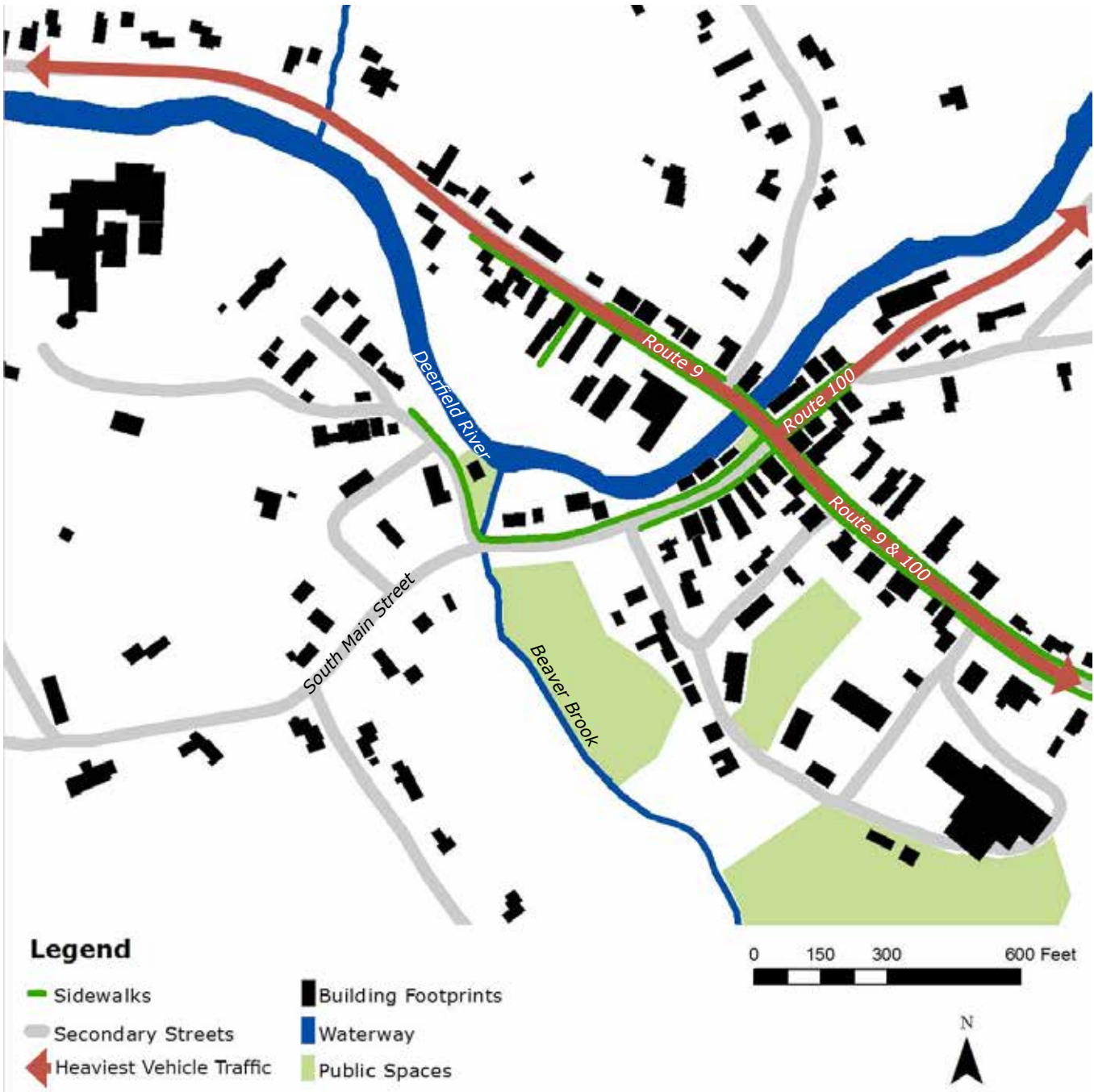
Observations

- Most slopes in the village center and some in nearby areas are less than 8 percent.
- Several areas with slopes of 3 percent or less exist within one-third of a mile of the village center.
- Many of the steepest slopes in the village area, including those 15 percent or greater, are found along the banks of waterways.

Implications

- Areas with gentle slopes outside of the floodplain could provide opportunities for future development.
- The most easily walkable areas include the parking lot behind West Main Street and the ballfields behind the high school (both in the floodplain), and the areas surrounding Church Street, the Wilmington Propane company, and the former Barnboard factory (all out of the floodplain.)

ACCESS & CIRCULATION ANALYSIS



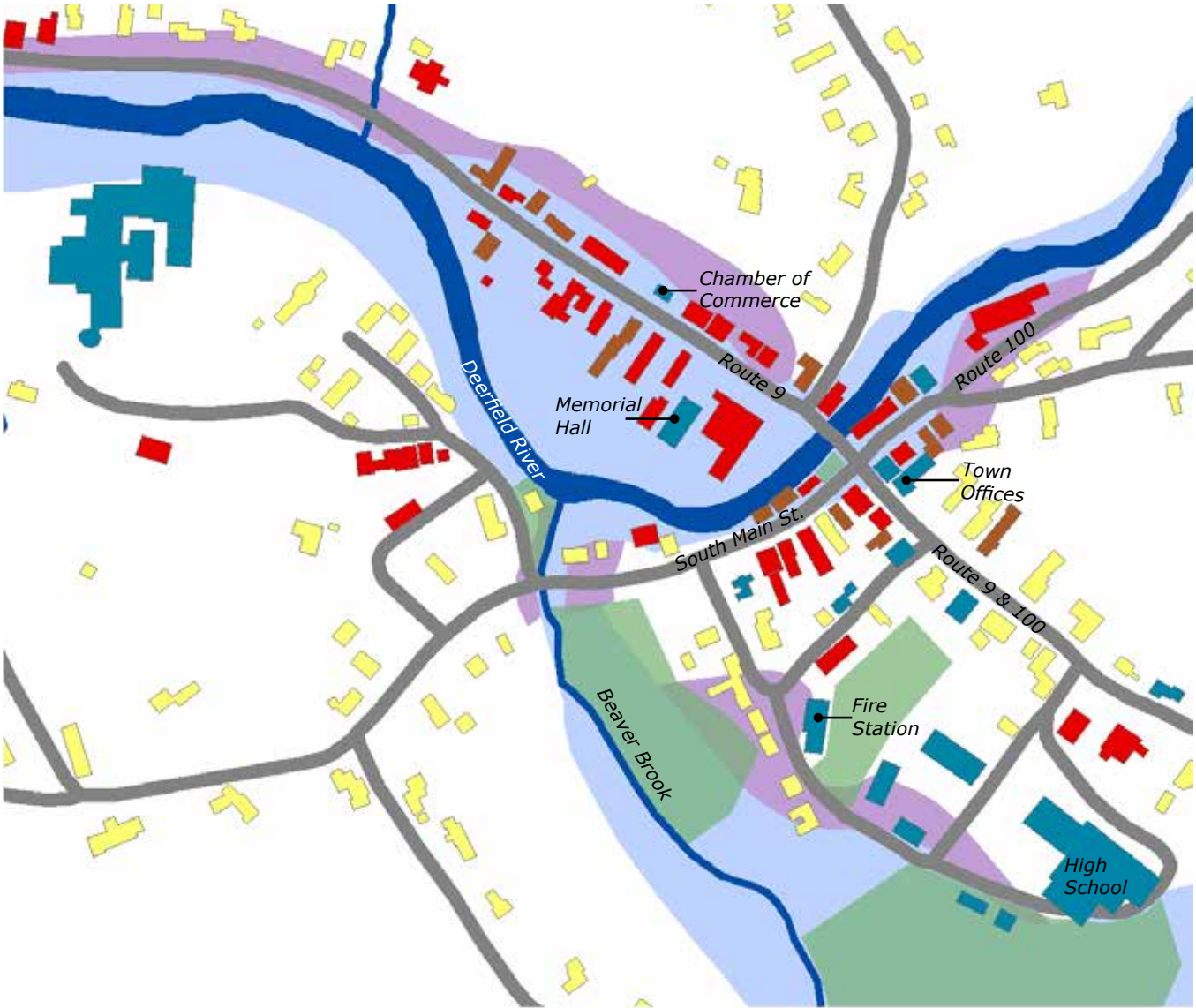
Observations

- Heavy vehicle traffic runs east-west and northward along Routes 9 and 100.
- Sidewalks total about one mile in length and are typically present on roads with heavy vehicle traffic.
- Four public green spaces, ranging in size from less than one-quarter of an acre to several acres, are mostly located on the outskirts of the village yet still within a several-minute walk of the town center.

Implications

- Heavy traffic along Routes 9 and 100 creates a potential customer base and an opportunity for commerce.
- Traffic noise and exhaust fumes diminish the pedestrian experience along these routes.
- Public green spaces are fairly accessible, though not well-integrated into the village.

BUILDING USE ANALYSIS



Legend

- | | | |
|---------------|----------------------|---------------------|
| Public Spaces | Mixed Use Comm./Res. | Waterway |
| Civic | Residential | 100-Year Floodplain |
| Commercial | Streets | 500-Year Floodplain |

Observations

- Commercial, residential, and civic uses are distributed throughout the village center, with relatively higher densities of residences and civic buildings on the eastern portion and outskirts of the village.
- Most of the commercial buildings in the village are within the floodplain.

Implications

- Continued integration of residential and commercial uses would help support community engagement and a more sustainable village while providing a potential customer base for economic revitalization.
- Future flood events will likely harm most businesses in town and some civic buildings, such as the fire station, town hall, Memorial Hall, and the Chamber of Commerce.

VACANCY ANALYSIS



Legend

- | | | |
|-----------------------------|------------------|---------------------|
| Building Lost, Not Replaced | Partially Vacant | Waterway |
| Occupied | Vacant | 100-Year Floodplain |
| Temporarily Vacant | Streets | 500-Year Floodplain |

Observations

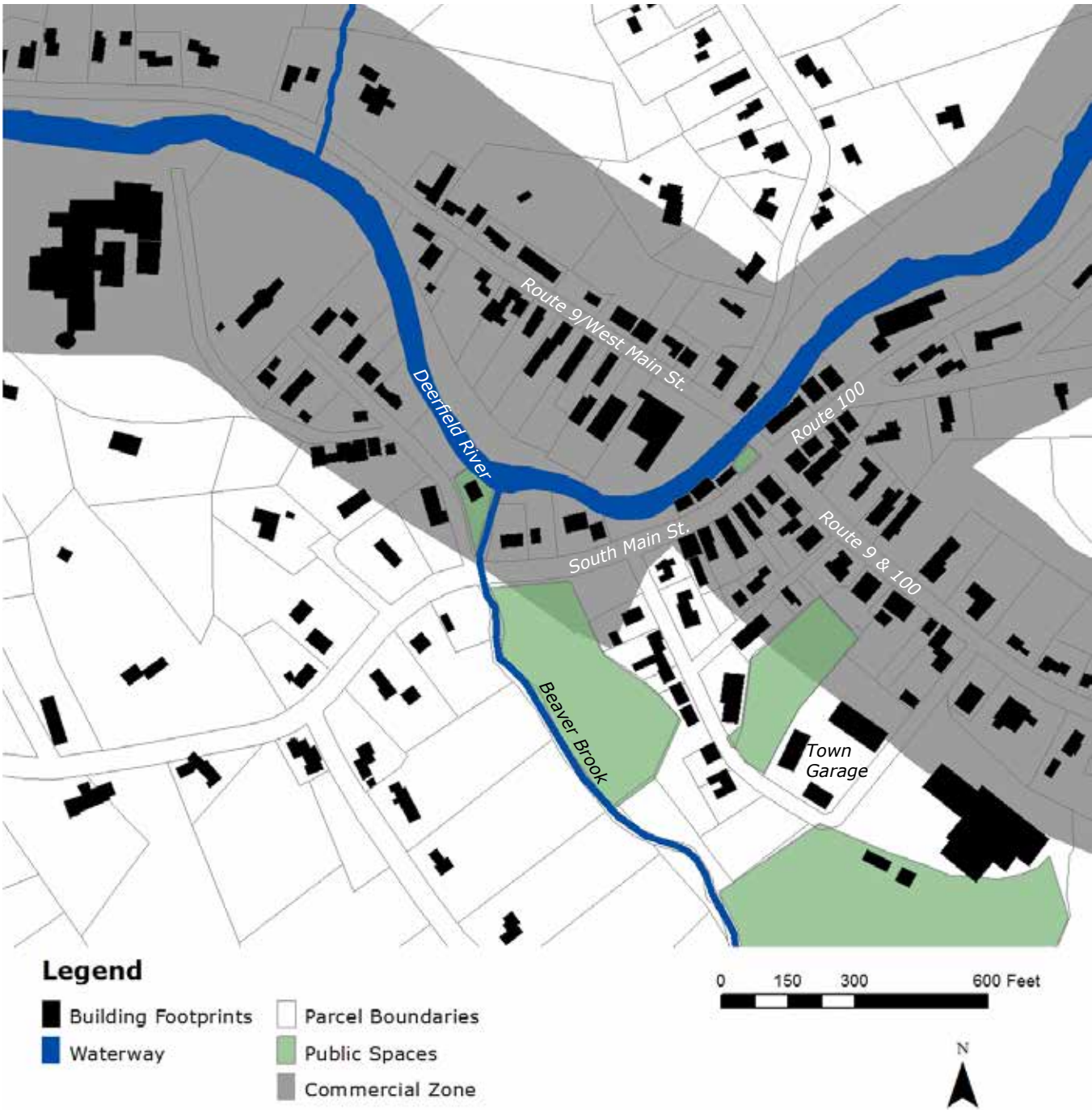
- Currently, there are at least eighteen vacancies in and around the village.
- Vacancies exist in and out of the floodplain.
- Many vacancies were directly caused by Irene as a result of structural damage or indirectly through economic hardship associated with reduced commerce.
- At least seven structures in the floodplain no longer exist, mostly due to past floods.

Implications

- Numerous vacant buildings combined with the risks of being in a floodplain may make it difficult to find tenants and landowners, thereby eroding community vibrancy and the economic viability of existing businesses.
- As time goes on, it is likely that more buildings will be lost within the floodplain due to destructive floods, town flood hazard zoning, and FEMA regulations.

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CURRENT ZONING ANALYSIS



Observations

- Within the village area, the commercial zone extends 300 feet on either side of Routes 9 and 100, except for the southern side of West Main Street where it extends 600 feet.
- Residential units are allowed in the commercial zone.
- Within the commercial zone, lodging, professional offices, studios are allowed. Retail stores, restaurants, and manufacturing operations require a permit.

Implications

- The diversity of permitted uses within the commercial zone allows people to live, work, and shop within close proximity, creating opportunities for a walkable community.
- The land in and around the town garage is currently zoned for residential use and may not be developable for commercial use without a variance or waiver, despite the commercial use already occurring there.

ZONING ANALYSIS: RESTRICTED AREAS



Observations

- New buildings in the commercial zone require:
 - A setback of at least 40' from all property lines.
 - A minimum lot size of 1 acre.
 - A minimum road frontage of 150'.
- Under current zoning, areas that do not meet the setback requirements (shown in red) are unbuildable without a variance or waiver.

Implications

- Current zoning requirements discourage pedestrian-friendly village development.
- Current zoning requires most development to go through a variance or waiver process. According to the Wilmington Zoning Department, "variances are rarely granted" and "even waiver criteria, which are easier to meet, will not allow for most projects."

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STREETSCAPES 1

One of the goals of this plan is to make recommendations for creating attractive, pedestrian-friendly streetscapes, and in order to do so, it is important to examine how the current streets and sidewalks function and appear.



Village sidewalks are narrow. While there is a parallel parking lane between the sidewalk and road in some locations, the sidewalk feels very exposed when there are no cars parked and trucks drive past.

Some sidewalks end abruptly into an expanse of asphalt, creating an uninviting streetscape and conflict points between cars and pedestrians. There are also few trees in the downtown and the street may get hot on summer days, causing walkers discomfort.



Parking signs are small, difficult to see, or nonexistent. Visitors may not be able to find parking if spots along road are taken and may not decide to stop in town.

Many landowners along Routes 9 and 100 have private driveways with curb cuts, which makes sidewalk travel difficult for some users and creates conflict points between pedestrians and vehicles.



Wilmington sits at the crossroads of two state highways, Routes 9 and 100, which bring heavy traffic including truck traffic through town. This traffic has been reported to move faster than the speed limit of 25 mph.

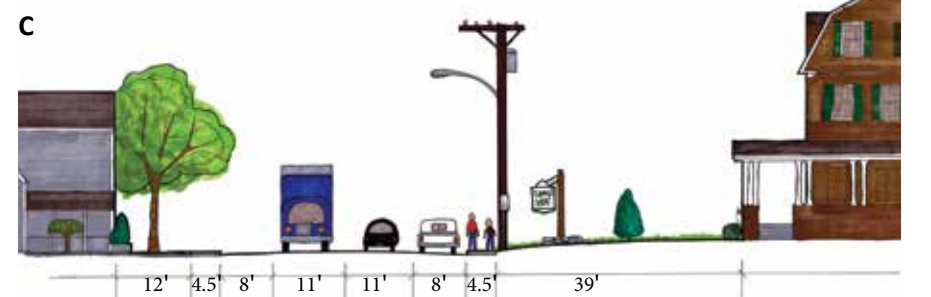


A Current streetscape looking south along West Main Street. Buildings are spread out with many curb-cuts between them, as shown below the diagram.

Existing Streets in Section



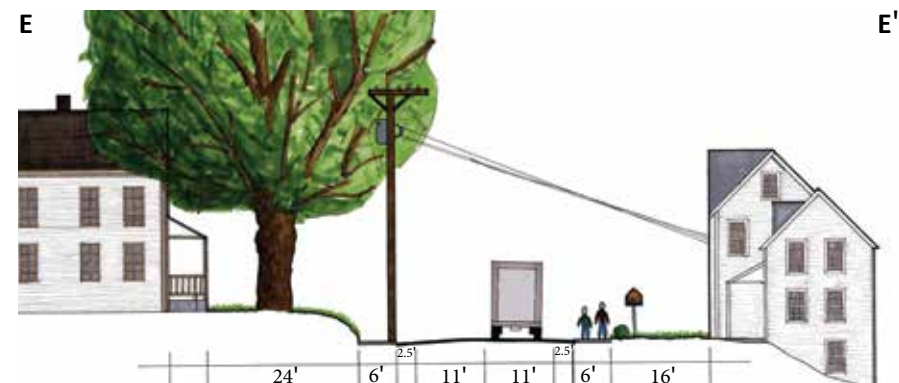
At the western entry to town, there is a 4.5' sidewalk on the southern side of the street, which is directly adjacent to the travel lanes. On the northern side of West Main, a 3' stone retaining wall borders the road shoulder. Most buildings in this area are around 20' tall.



Moving toward the center of town, parallel parking and sidewalks border both sides of West Main. Most buildings are 20-40' feet tall and are used for both commercial and residential purposes.



Along South Main, there is parallel parking on the east side of the street. Buildings are mostly 30' tall and close to the 5' sidewalk. Buildings on the western side overhang the Deerfield River.



There are 6' sidewalks on both sides of East Main Street and no parallel parking. On the north side of the street, there is a slope up to a row of large sugar maples. Buildings, which are around 30', are set back from the street. There are mostly residences in this area.

STREETSCAPES 2

Existing Conditions

Floodplain

Areas within the floodplain will likely suffer future damage from flooding. As a result, infrastructure investments should be weighed carefully in these areas to minimize future losses.

Sidewalks and Crosswalks

Sidewalks are currently 4.5-6' wide and often do not meet the recommended minimum width of 5' (ADA), or the VT Complete Streets recommendation of 8-12' in village centers. There may not be space for wheelchairs to pass and the sidewalk is not wide enough for street trees, amenities, or street furniture.

Existing sidewalks are broken up by many curb cuts (ideal 1-2 per block, VT Complete Streets), which may be difficult for some users to navigate. Sidewalks do not exist along the western portion of West Main Street or along Beaver or School Streets.

There are only six crosswalks including the four at the main intersection. Because of the lack of sidewalks and crosswalks, it may be uncomfortable for pedestrians to access some buildings.

Utility Poles and Wires

Utility poles are located every 125' immediately adjacent to sidewalks. They restrict the widening or creation of sidewalks on one side of every street. Poles can be moved or lines buried, but both are expensive options. Wires are approximately 20 feet above the ground and restrict the height of trees planted underneath.

Parallel Parking

Parallel parking on main roads does not extend the length of the village. Where it exists, it buffers the sidewalk from the road. Some parallel parking spaces could be used to widen sidewalks but this would only be possible in the center of the village.

Some parallel parking spaces could be turned into bulb-outs, but these slow traffic most effectively if they are located at the entrance to a village. Bulb-outs could provide pedestrian spaces in the center of town but are expensive and permitting will be difficult on a state highway.



Parking Lots

Several parking areas (1, 2, and 3 on map) border roads without sidewalks or clear entrances or exits, meaning that pedestrians, parking vehicles, and highway traffic may be in conflict along the road. Two parking areas are located at entrances to the village center. Large expanses of parking do not slow traffic or provide a good transition to the village center and can be hot, exposed, and unattractive to pedestrians.

Buildings

Buildings are located close to the street, particularly along South and North Main Street and there is little space to widen sidewalks or plant street trees, or add amenities there.

Traffic Speed

Vehicles in Wilmington village reportedly exceed the 25 mph speed limit, which is dangerous to pedestrians.

Street Trees

There are currently few street trees in Wilmington with the exception of large maples in front of the eastern half of Crafts Inn and along the steep northern side of West Main Street. Because there are few street trees to provide shade, slow traffic, and filter road runoff and stormwater, the streetscape is less inviting for pedestrians and may not be providing beneficial ecological services.

Lighting

Wilmington has standard "cobra-head" AOT streetlights, which provide light that is adequate but not scaled appropriately for pedestrians. However, there is no room to add streetlights in the current sidewalk. While streetlights could possibly be placed between the sidewalk and buildings, tree roots might interfere with buried wires there.

Slopes

In two areas, slopes or existing retaining walls are adjacent to the road or current sidewalk, particularly on the north side of Route 9. Widening current sidewalks or adding other infrastructure or amenities will be more expensive in these locations.

MASTER PLAN RECOMMENDATIONS: AN OVERVIEW

Bringing the Analyses Together

The analyses demonstrate the challenging position that Wilmington faces:

- Half of the village is within the floodplain, which poses an ever-present threat of physical and economic devastation. Much of the village's charm lies in its historic buildings, most of which are located in the floodplain. The floodplain likely deters potential businesses from investing in the village.
- Routes 9 and 100 bring heavy vehicle traffic to the village, creating opportunities for commerce but also significantly detracting from the pedestrian experience in the main shopping district. Because the town is heavily reliant on a tourist economy, an attractive, bustling village center is critical to encouraging tourists to stop.

- The town is struggling economically. Vacant buildings deter both new investment and tourists.

The community has requested strategies to help achieve economic revitalization, specifically streetscape improvements and a redesign of public spaces. Both of these requests have been met with designs that offer pedestrian-friendly features suitable for the floodplain.

Over the long-term, it will be difficult to create a vibrant, sustainable economy in the village center as long as it is mostly located within a floodplain and adjacent to a major state highway. Thus, locations for new development are evaluated in the sheets that follow.

Recommendations

These recommendations will be explained in greater detail in the following sheets.

Within the floodplain

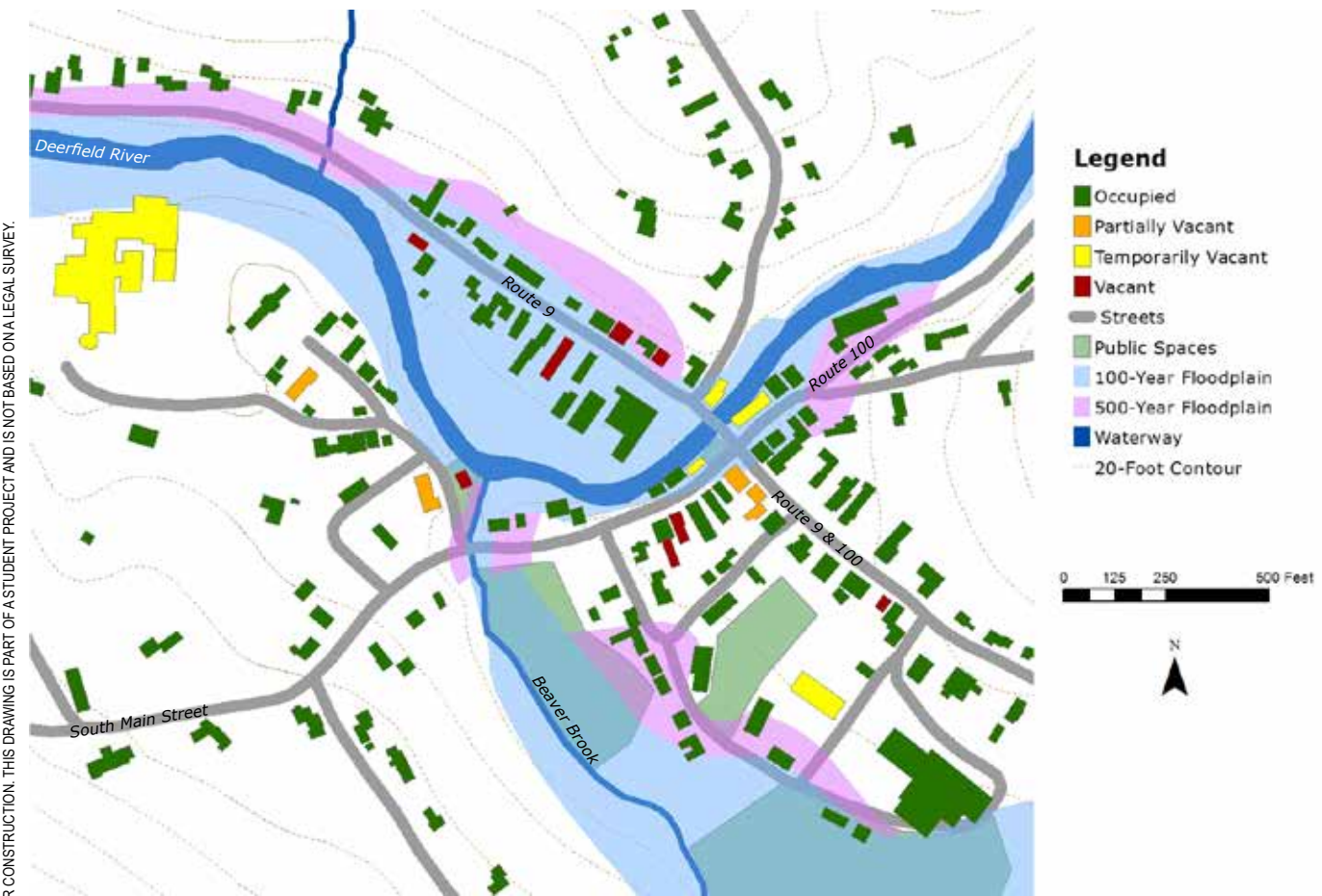
- Revitalize three public green spaces (see map below). Floodplain-appropriate and relatively low-investment strategies should be used. These public spaces include:
 - A. The former Brissette property
 - B. Buzzy Towne Park
 - C. West Main Street parking lot
- Limit significant structural investments that are prone to flood damage.
- Reduce impervious surfaces and increase stormwater storage capacity.
- Plant street trees and other vegetation.
- Consider moving existing structures or, if damaged by floods, rebuilding structures outside of the floodplain.

Village-wide recommendations

- Enhance streetscapes to create a more inviting and walkable village. Within the floodplain, streetscape improvements should be flood-appropriate and relatively low-investment.
- Adopt new zoning regulations to encourage future development that is pedestrian-friendly and attractive.

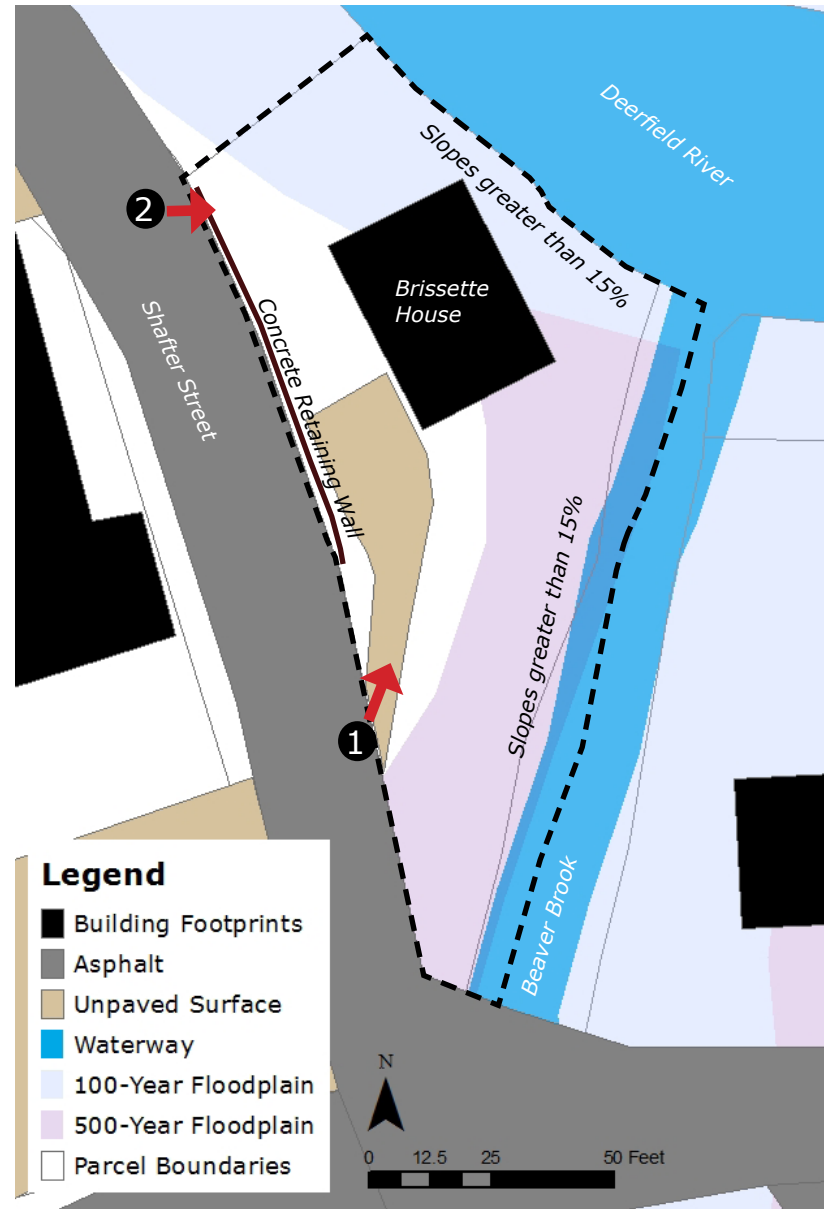
Outside the floodplain

- Create inviting streets and a strategy for promoting development in suitable areas.



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FORMER BRISSETTE PROPERTY



Existing Conditions

The Brissette property is located at the confluence of the Deerfield River and Beaver Brook. It is about one-fifth of an acre in size and well over half of the lot is located in the floodplain.

A steep bank rises from the Deerfield River and then levels out in the western portion of the lot. A retaining wall on the west edge stabilizes Shafter Street above.

The Town of Wilmington will purchase the Brissette property with funds provided by FEMA. As a condition of FEMA's Property Acquisition program, the community must own and maintain the land as open space in perpetuity (FEMA). The house will be removed and the lot converted to public green space.

Design Directives

Improvements within the floodplain should be able to withstand periodic flooding.

Steep slopes should be inaccessible in order to prevent erosion and reduce the risk of injury.

Vegetation should be maintained on the slopes to help stabilize the banks.

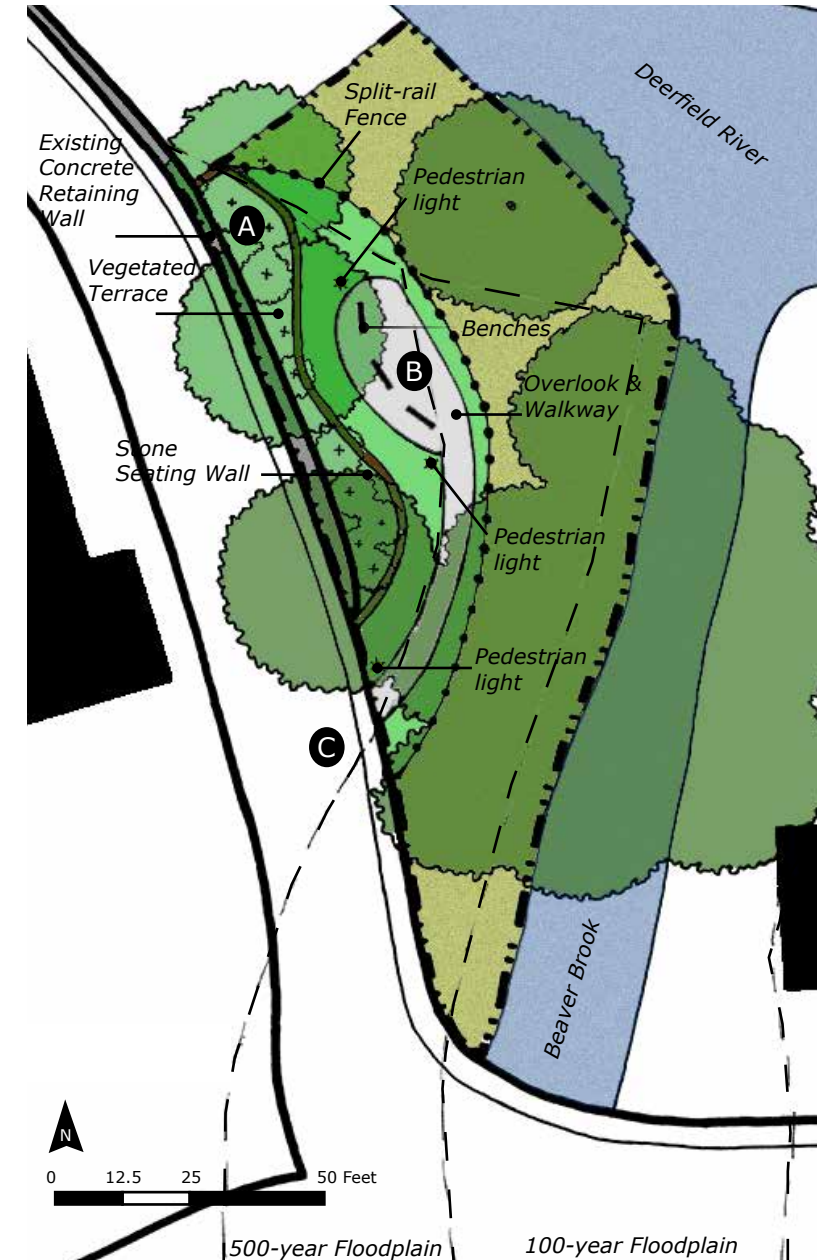


1 The former Brissette house was badly damaged by flooding during Tropical Storm Irene.



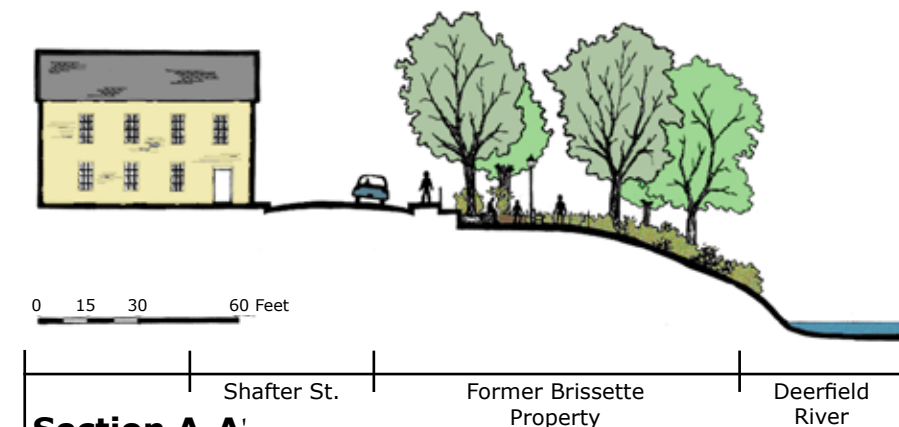
2 The property offers beautiful views of the Deerfield River below.

Final Design



With the house removed, the property is transformed into an intimate green space for small gatherings and individual reflection.

- A A curved stone seating wall terrace expands the existing concrete retaining wall for a more inviting environment. On the terrace, small trees and other native vegetation create a sense of separation from the street.
- B A compacted gravel walkway leads to a set of benches surrounded by a mowed, grassy plateau, creating a comfortable place for community members to sit and enjoy the beauty of the Deerfield River. Three attractive pedestrian lights along the pathway lead into the site and enhance public safety. Picnic tables and a BBQ grill could also be installed as funds and community desires allow.
- C On the slopes dropping to the water, low-growing native grasses and forbs (up to 36" high) are planted to stabilize the banks (see page 23 for plant palette). A split-rail fence along the edge of the plateau discourages people from disturbing the vegetation on the slope and improves safety. The lower branches of mature trees are trimmed as necessary to maintain views of the river.



Section A-A'

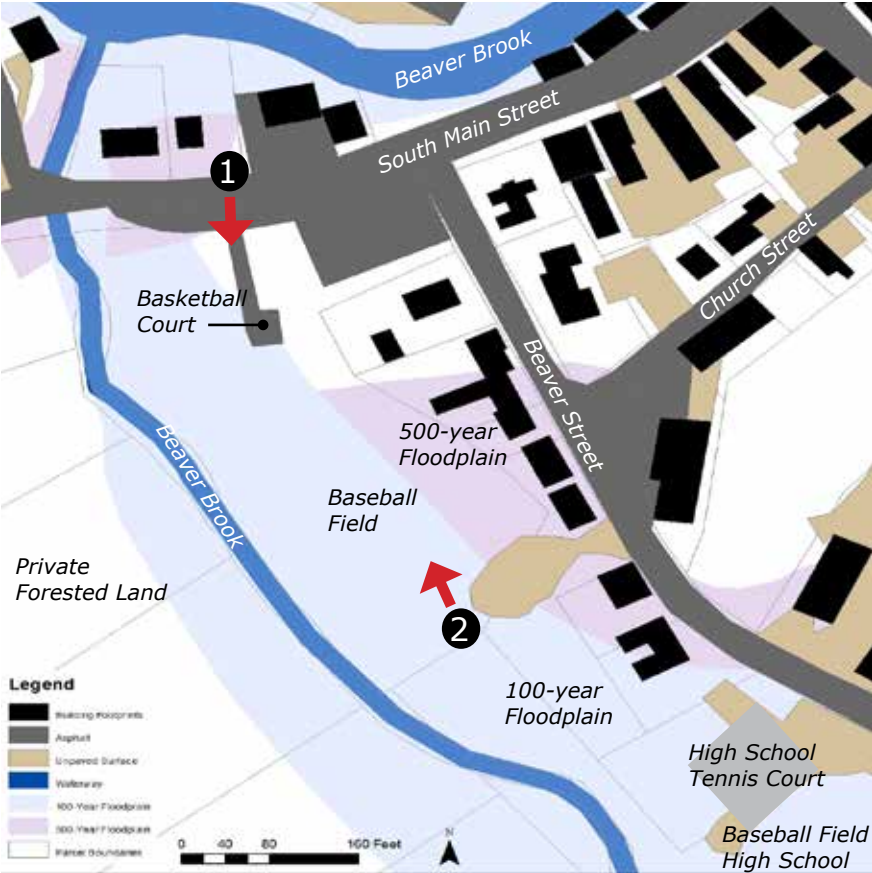
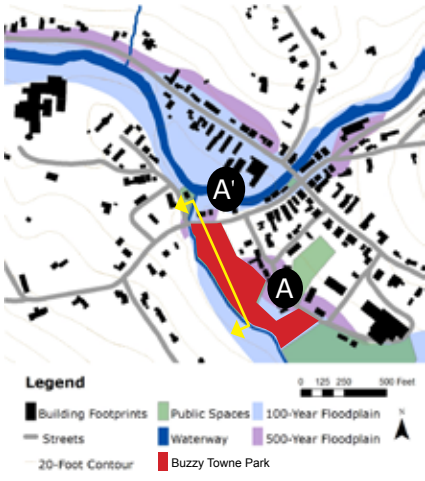
Note: Section is based on a twenty-foot contour. A survey would be needed to check the accuracy of slopes.

Buzzy Towne Park

Existing Conditions

Buzzy Towne Park is approximately 2.7 acres in size and is almost entirely located within the floodplain of Beaver Brook, which borders the park to the west. Community members report that at least some flooding occurs annually due to snowmelt and heavy rainfall.

The park contains a baseball diamond, a basketball court, and a picnic table. Although it is located on the village outskirts, it is just a few minutes walk from the main intersection. High school tennis courts and athletic fields are located a couple hundred feet to the southeast. Buzzy Towne Park is connected to the high school athletic field by an unmaintained trail. According to some community members, the park is used infrequently.



Design Directives

All improvements must withstand periodic flooding or be portable so that they can be moved when large storms are predicted. Improvements should not displace floodwaters.

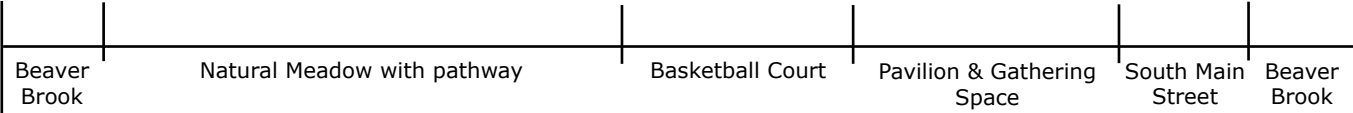
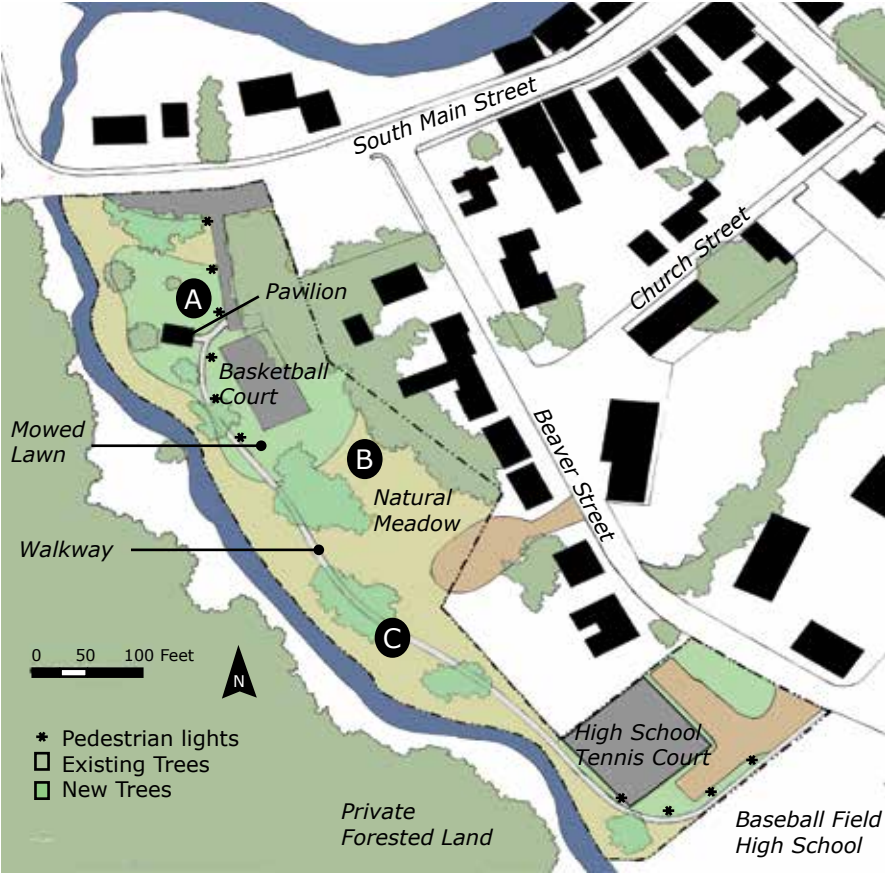
For safety, public areas should be well-used or at least have good visibility from other well-used areas such as streets.

Final Design

The revitalized Buzzy Towne Park creates an active public space for small and medium-sized gatherings in the northern half of the park while the southern half is converted to a low-maintenance, natural meadow.

- A A pavilion close to South Main Street serves as a stage for performances and allows for community events and private gatherings. It is situated to allow audience seating in the grass to the north. The pavilion, well-anchored and constructed with materials resistant to flood damage, is equipped with moveable picnic tables and trash receptacles.
- B The existing baseball field is converted to a meadow with native vegetation for storing and infiltrating stormwater. The town could consider excavating a detention basin in this area to increase water storage, which would help mitigate flooding elsewhere during small to moderate events.
- C A quiet walkway removed from vehicle traffic meanders through the meadow and alongside Beaver Brook. The barrier-free walkway, constructed of compacted gravel, connects South Main Street to Beaver Street,

enhancing the town's walkability. Ten pedestrian lights are installed in the more heavily used areas to increase public safety. Note: The community should evaluate the safety of a pathway through the southern portion of the park due to its relatively low visibility. With the exception of canopy trees, the vegetation should be maintained at an overall height of 36" or less for adequate visibility. Additionally, lighting should be extended the full length of the walkway if all-night use is permitted.



Section A-A'

Note: Section is based on a twenty-foot contour. A survey would be needed to check the accuracy of slopes.



Buzzy Towne Park attracts people for informal athletic games as well as small gatherings.



Buzzy Towne Park's baseball field (shown above) is within a couple hundred feet of the high school's baseball field. The high school is relocating, which will reduce the demand for athletic fields.

WEST MAIN STREET PARKING LOT

Existing Conditions

The West Main Street parking lot has about 70 spaces on roughly 1.5 acres and is located in the floodplain. It experiences some flooding each year from storm events and snowmelt.

The parking lot is hardpacked soil. Undefined parking spaces and a near absence of signs cause haphazard parking and confusion among visitors, creating an uninviting environment.

A berm that runs between the parking lot and the Deerfield River may have been constructed after the 1938 flood. Two cuts were made after Tropical Storm Irene in order to drain water from the lot. The berm is nearly six feet high in some places and visually separates the river from the parking lot and buildings behind it.

Design Directives

Amenities must be planned and constructed to flood zone standards.

Design should mitigate the effects of stormwater runoff by storing and/or infiltrating water during moderate storm events.

Parking spaces should be defined and signs placed to enhance clarity, particularly for visitors.

Final Design

The enhanced West Main Street parking lot invites visitors to park and improves access from the parking lot to the core of the village and the recently constructed pedestrian bridge.

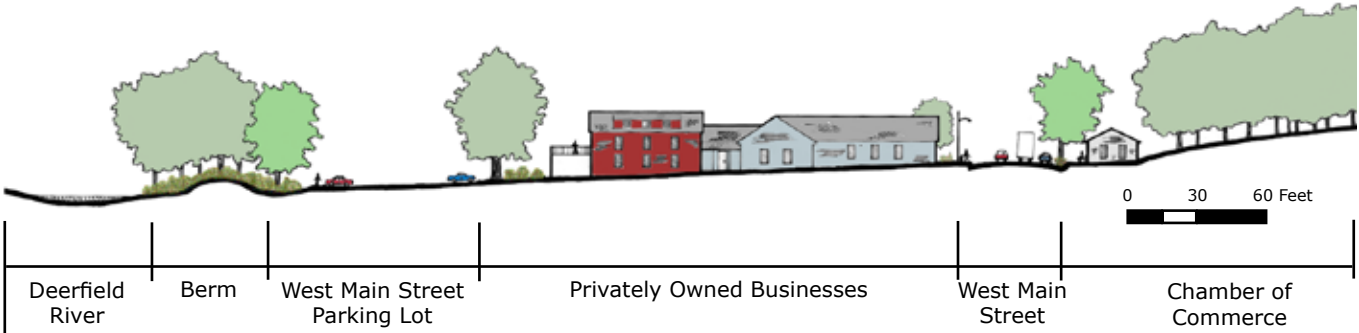
A A walkway parallels the Deerfield River, connecting the pedestrian bridge at the west end of the village to the Route 9 bridge, providing a quiet route removed from the heavy highway traffic. To create room for the walkway, nine 90° parking spaces at the west end of the lot are converted to six parallel spaces.

B Two rain gardens, filled with a diversity of native vegetation, enhance the pedestrian experience by creating separation between the walkway and parking lot. They simultaneously infiltrate stormwater from the parking lot and educate the public about native vegetation.

C Each parking space is designated with a wheel stop. Attractively designed signs are posted to differentiate private from public parking and tell visitors where parking is permitted.

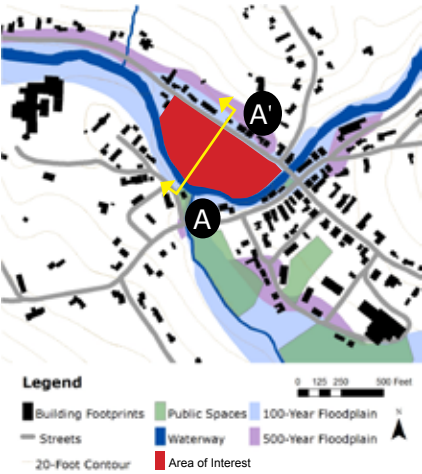
Note: Although the berm may provide psychological security, it may not be providing any real protection because it does not extend upstream, large floods overtop it, and two cuts were made after Irene. The community should consider hiring a fluvial geomorphologist to evaluate removal of the berm.

Removing the berm might help mitigate smaller flood events by providing space for extra water storage. A walkway along the river would have a more attractive view of the water if the berm were gone.



Section A-A'

Note: Section is based on a twenty-foot contour. A survey would be needed to check the accuracy of slopes.

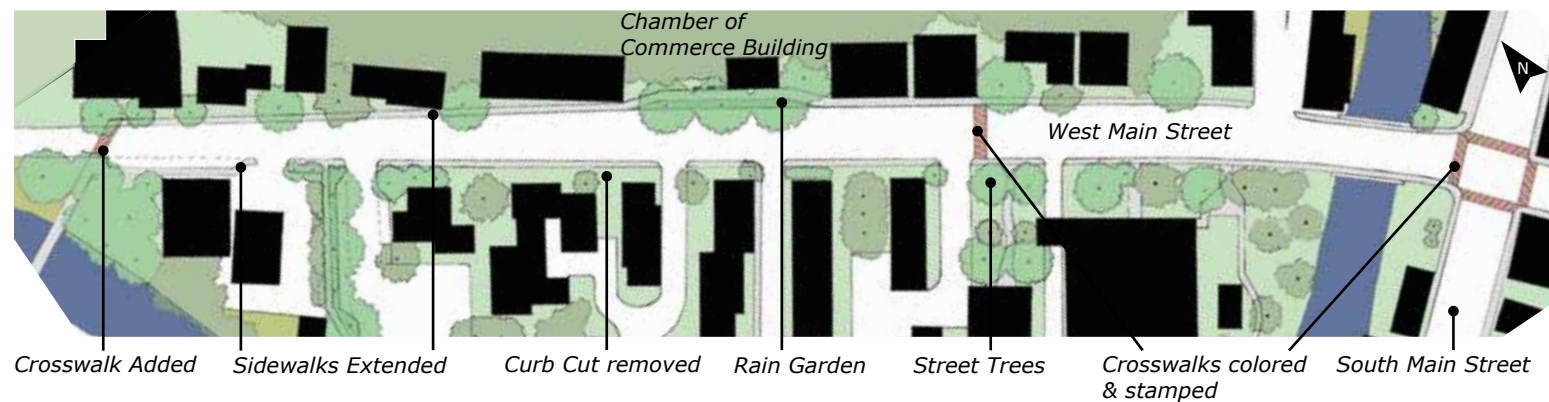


1 The West Main Street parking lot, located on land owned by adjacent businesses, was recently leased to the town as public parking.



2 With roughly an eight foot elevation gain from the Deerfield River (foreground) to the West Main Street parking lot (background), the lot is prone to flooding.

Suggested Streetscape Improvements



Streetscape design for West Main Street

While streetscape improvements may have positive economic effects, the village center has significant restrictions that will make streetscape improvements more expensive. Additionally, improvements in the floodplain may be destroyed by future flooding and thus the extra expense may not be justified.

We strongly suggest minimizing structural investments in the floodplain.

Plant trees. Shade trees should be planted as space allows. Tree species of varying sizes and adaptability are provided in the plant palette on sheet 25. Plant trees as close to the road as possible and in the sidewalk if sidewalks are widened. While large trees offer greater benefits, short species (less than 15') should be used under power lines. Trees can withstand flooding and provide a host of benefits.

Extend sidewalks on the southern side of West Main Street to the new pedestrian bridge. On the northern side of West Main, a sidewalk could run on top of the current retaining wall with a universal access ramp on the eastern end connecting to a new sidewalk in front of the Chamber of Commerce building.

Sidewalks could also be extended along Beaver and School Streets where none exist currently (see map on sheet 10).

Widening Sidewalks will be least difficult on the northern side of West Main and on the southern side of East Main because there are no utility poles there, although buildings may be located too close to the road for this to be feasible.

Reduce driveways and curb cuts, particularly along West Main if possible. Only one is shown as being

removed in this design. Discussions should happen with building owners about the possibility of removing more.

Define parking and roadway. Define entrances to parking lots with vegetated strips, rain gardens, and trees so drivers know where to enter and exit.

At the Chamber of Commerce building and the west end of the village, reduce pull-in parking spots along the road and replace them with parallel parking spots, a curb, and sidewalk. This will reduce safety hazards, break up the view of parking lots and cars, provide shade, and enclose the road. These green areas can be outfitted with rain gardens, which will infiltrate runoff from the road and buildings and filter out pollutants before water reaches the storm drain or river.

Provide amenities such as benches or low seating walls on every block. Trash and recycling receptacles, drinking fountains, and public restrooms are also appreciated by pedestrians (VT Complete Streets).

Add two crosswalks, one at the west end of the village and one at the north end. Stamping the crosswalks will help define the village center as a place and alert drivers that they are entering a pedestrian realm.

Add or improve signs. Add signs at the entry points to the village center and site larger, more prominent parking signs.

Install rain gardens in front of the Chamber of Commerce in order to infiltrate stormwater and separate pedestrians from the street.



Red Mill Inn, located in the floodplain, before and after proposed vegetation.



As visitors arrive at the western end of the village center, they are currently greeted with an expanse of gravel, a vacant building, and a nearly treeless street. Suggested improvements to this area within the floodplain include extended sidewalks on both sides of the street, a new stamped crosswalk, vegetation, and street trees.



The Chamber of Commerce building, within the floodplain, is currently surrounded by pavement and hardpacked soil. Suggested improvements include trees, an extended sidewalk, more parallel parking, and a rain garden to infiltrate runoff from the road.

ZONING AND STREETSCAPE DESIGN

Streetscapes and the pedestrian experience are greatly affected by zoning regulations. The type of zoning in place determines the placement of buildings within a lot and their relation to roads and sidewalks. It can also specify desired types of streetscapes.

In the early 1900s, most towns and cities in the US, including Wilmington, didn't have zoning laws. These towns and cities were oriented for pedestrian access with buildings located close to the street and a mix of businesses and residences in downtown areas. However, industries of the time were dangerous, noisy, and polluting and were often located close to residences. Zoning was developed in order to separate uses that were not compatible, support orderly growth, prevent overcrowding, and alleviate congestion. Wilmington adopted zoning fairly late, in 1968.

Conventional zoning had some unintended consequences, including automobile-dependent sprawl and uninviting streetscapes. In existing village centers such as Wilmington,

conventional zoning has made it very difficult to build in the traditional style on small lots close to the road and within walking distance of homes because of large setbacks, frontage, and acreage requirements. Developments with large parking areas adjacent to main roads required no variances and were easier to build, which is still the case in Wilmington today.

As previously noted, variances to build on nonconforming lots are rarely granted in Wilmington and even waiver criteria, which are easier to meet than variance criteria, will not allow for most projects. The applicant must make a strong case in order to gain approval (Wilmington Zoning Department). In Wilmington, floodplain zoning in nearly half of the village center adds another layer of difficulty. Most developers today are likely to build along Route 9 and Route 100 where constraints are fewer, which means that this new construction will not contribute to the vibrancy of the village center.

Form-based codes have been developed in response to conventional zoning. They support traditional village form by

regulating the relationship between buildings and the street. In addition to regulating what communities don't want, FBCs show what is desired by specifying building height and massing, percentage of window coverage, parking locations, sidewalk widths, street tree plantings, and maximum setbacks so buildings are close to the road

Segregating truly incompatible uses is still a component of form-based codes, but emphasis is on building form and mixing uses that are compatible in order to improve walkability and create a vibrant sense of place. Form-based codes can help support economic revitalization and sustainable communities by creating the foundation for an attractive, pedestrian-friendly village center. Because the codes themselves have a graphic component, they can be easier to understand than conventional codes. Further, because the dimensional requirements needed for development are reduced, fewer variances are needed, making it easier for new development to occur.

Villages Before Zoning	Conventional (Euclidean) Zoning	Form-Based Codes
Generally pre-1950s	Post-1950s	Post-1970s
Buildings close to the street	Buildings set back from the street	Buildings close to the street in village centers
Pedestrian-friendly and walkable (human-scaled)	Automobile-dominated	Pedestrian-friendly and walkable (human-scaled)
Uses integrated	Uses segregated	Most, but not all uses integrated
Compact village streetscape	Sprawling streetscape	Compact village streetscape



The historic town offices and many other structures in Wilmington's village center were built before zoning was implemented.



This strip in Hadley, MA, was built under conventional zoning and is automobile-dominated. There are few sidewalks to the stores, and it is uncomfortable to walk on expanses of asphalt.



As Dover, New Hampshire's form-based code was still being formulated in 2009, developers saw the possibilities and built this multi-use bank building with luxury apartments above. (Photo: Sullivan Construction)

NOT FOR CONSTRUCTION. THIS DRAWING IS PART OF A STUDENT PROJECT AND IS NOT BASED ON A LEGAL SURVEY.

ZONING: FUTURE DIRECTIONS

Standish Corner, Maine

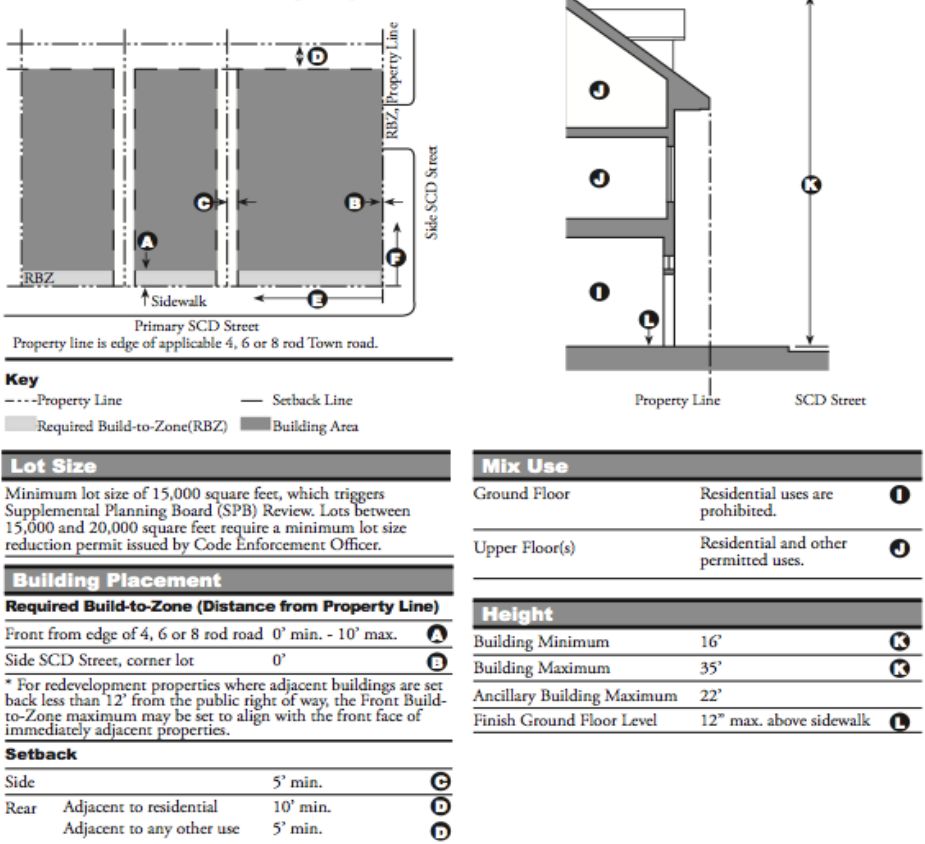


Standish Corner today and a rendition of what the village might look like after 20-40 years under form-based codes. (Photos: Terrence J. DeWan & Associates)

This village of 464 people wanted to establish mixed-use, interconnected village-scale neighborhoods and retain the rural character of the region by funneling most growth into a denser village center.

They passed their form-based code in 2010, which required wider sidewalks, on-street parking, plantings, crosswalks, and street trees, and specified build-to lines, frontage types, and percentage of wall covered by windows.

H. Town Center (TC) Standards

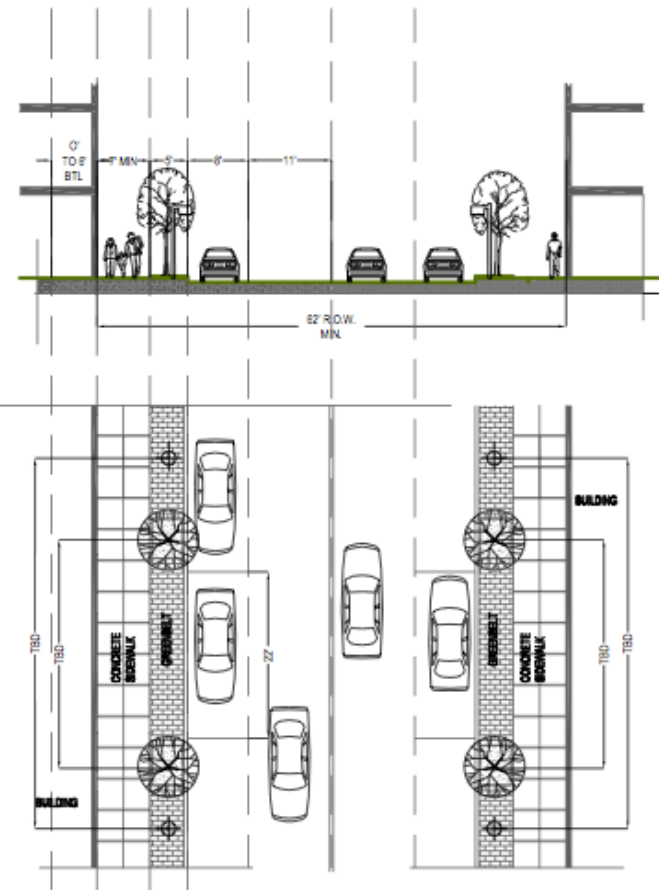


Standish's zoning code is image-based, clear, and easy for developers and citizens to understand. This page shows requirements for the town center area, which is delineated on a zoning map.

Newport, Vermont

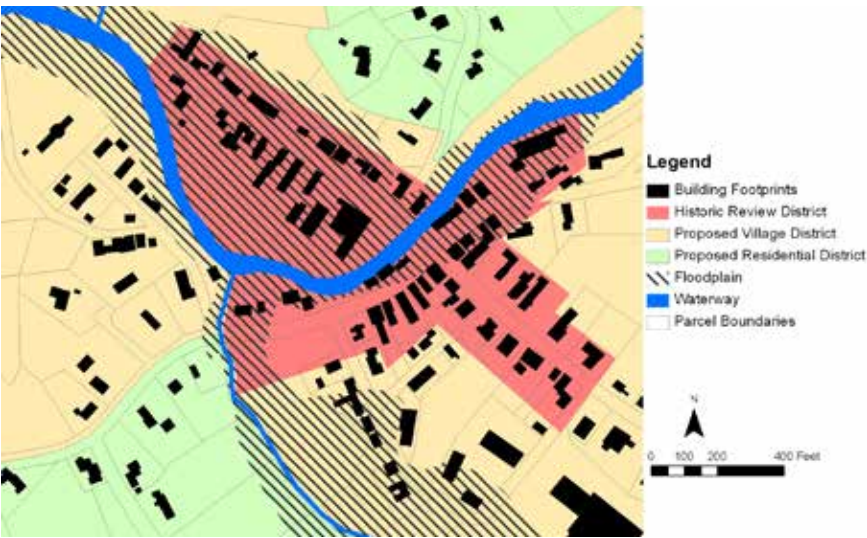
- In 2007, Newport received Vermont's Down-town Designation.
- In 2009, the town received a grant for a design assistance team. Community members were invited to participate in the design process via posters, newspaper articles, an electronic listserv, door-to-door visits, and a survey. A street party was held with free food. More than 500 people joined in focus groups, workshops, and town meetings.
- In 2010, a form-based code was passed.
- In 2012, the town's first project, an afford-able housing development, was built under a form-based code.

Other towns in Vermont investigating form-based codes include Westford, South Burlington, Huntington, and Shelburne. Chittenden County is looking for a form-based code consultant.



Newport's code specifies streetscapes associated with streets of various widths and the relationship between buildings, the pedestrian realm, and the street.

Zoning in Wilmington



Within Wilmington's Historic Review District, zoning currently requires that the architectural features of new construction complement the scale and design of the surrounding historic structures; however, these requirements are merely aesthetic and do not affect where a building is placed on the lot. The drafting of new zoning regulations has been in progress for about two decades.

Within the Historic Review District, the draft regulations created in June 2013 would require a minimum lot size of 1/8 acre, minimum lot frontage of 40', and minimum front, side, and rear setbacks of 0'.

Within the proposed Village District outside the Historic Review District, the current draft regulations would require a minimum lot size of 1 acre, minimum lot frontage of 150', and minimum front and side setbacks of 20'.

The current draft zoning is already moving in the direction of a form-based code by reducing setbacks, eliminating on-site parking requirements, and relaxing landscape requirements that make installing additional vegetation more difficult. Additional standards to influence the look of the village and a graphic component to the town's zoning would fit well with the direction the town is heading.

However, the bulk of the current Historic Review District is located in the floodplain and it may not make sense to zone for the densest development there, as floodplain zoning prevents most development. Functionally, the only developable areas in this district under the draft regulations are East Main Street and the western half of South Main Street.

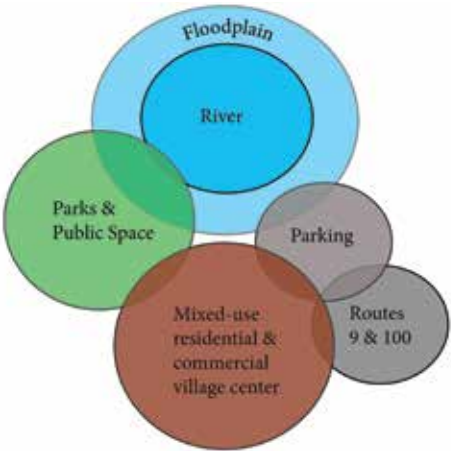
It makes the most sense to extend zoning for the densest development into areas where that development is possible, including along Beaver and School Streets and across the Deerfield River near Shafter Street.

LOCATION OF FUTURE DEVELOPMENT

As Wilmington grows, new development will need to be located somewhere. There are so many limitations and drawbacks associated with the floodplain that it is both unlikely and unwise for future growth to occur in this area. As the town looks to the future, where are the best areas to direct growth?

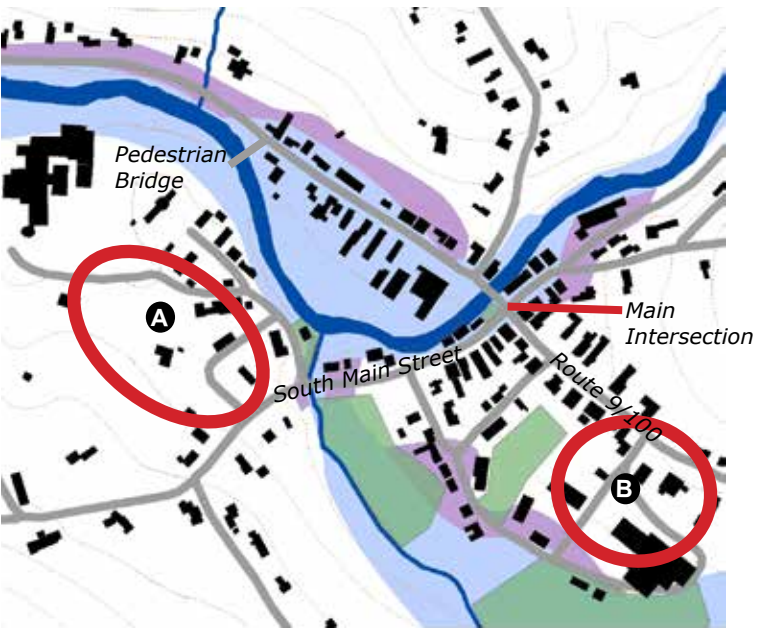
What Makes a Good Village Center?

- **Level or gently sloped.** Building is more expensive on steep slopes. For universal access, slopes should be less than 5%.
- **Residential and commercial uses mixed together near main roads and parking.** A mix of uses will provide a customer base for businesses and help create a vibrant downtown filled with people. Roads and parking should offer access to the village center but should not dominate the landscape, as a pedestrian-oriented village is more inviting to residents and visitors.
- **Buildings located outside the floodplain.** Economic and physical risks of devastation will be reduced.
- **Parks and public spaces can be within the floodplain.** However, wetlands are more effective at absorbing and slowing floodwaters and thus should be left undisturbed or restored if possible.
- **Truck traffic away from pedestrian streets.** Trucks may negatively affect pedestrian experience due to noise, vibration, and exhaust fumes.
- **Interconnected local street network.** A grid-like street network with many short blocks offers many options for travel between two points, reducing pressure on any one street or intersection as well as walking distances.
- **Parking within the floodplain only if space is limited.** It is not ideal to have parking within the floodplain due to potential contamination of the river and loss of use during large storm events, and because parking lots reduce the amount of rainwater that can infiltrate into the ground. However, where space is limited, it is better to have parking lots than buildings in the floodplain because parking lots do not displace floodwater or raise flood levels.
- **Build near existing infrastructure, where possible.** This will reduce costs and resource use.
- **Build, when possible, on already-disturbed sites.** This will reduce the environmental impacts of building and help preserve natural areas.



This concept diagram of Wilmington's village center shows good spatial relationships between functions. Overlapping areas indicate compatible functions; areas that are separate are functions that are not compatible.

Which Areas of Wilmington are the Best for Future Expansion?



The two areas indicated with red circles are suitable for future expansion. Both sites are out of the floodplain, relatively flat, located close to the current village, served by current infrastructure, and located away from current truck traffic.

A. Western Area Near Wilmington Propane

Pros

- An easy walk of 0.3 to 0.4 miles to the main intersection across the pedestrian bridge or by South Main Street.
- Area is 7-10 acres in size, providing room to expand.
- Slopes in this area are mostly between 0 and 3%, meaning that this area is mostly universally accessible.

Cons

- May require a second bridge over Deerfield River because streets are currently dead-end; however, this might improve traffic circulation throughout town.
- Site is mostly not disturbed or compacted except around Wilmington Propane. The current fields may have economic or ecological value in their present state.

B. Southeastern Area Near Town Garage and School

Pros

- An easy walk of 0.2 miles to the main intersection and 0.5 miles to the western side of the commercial district.
- Area is immediately adjacent to Route 9/100 and within an existing street grid.
- No new bridge is needed.
- Area is already disturbed and compacted.

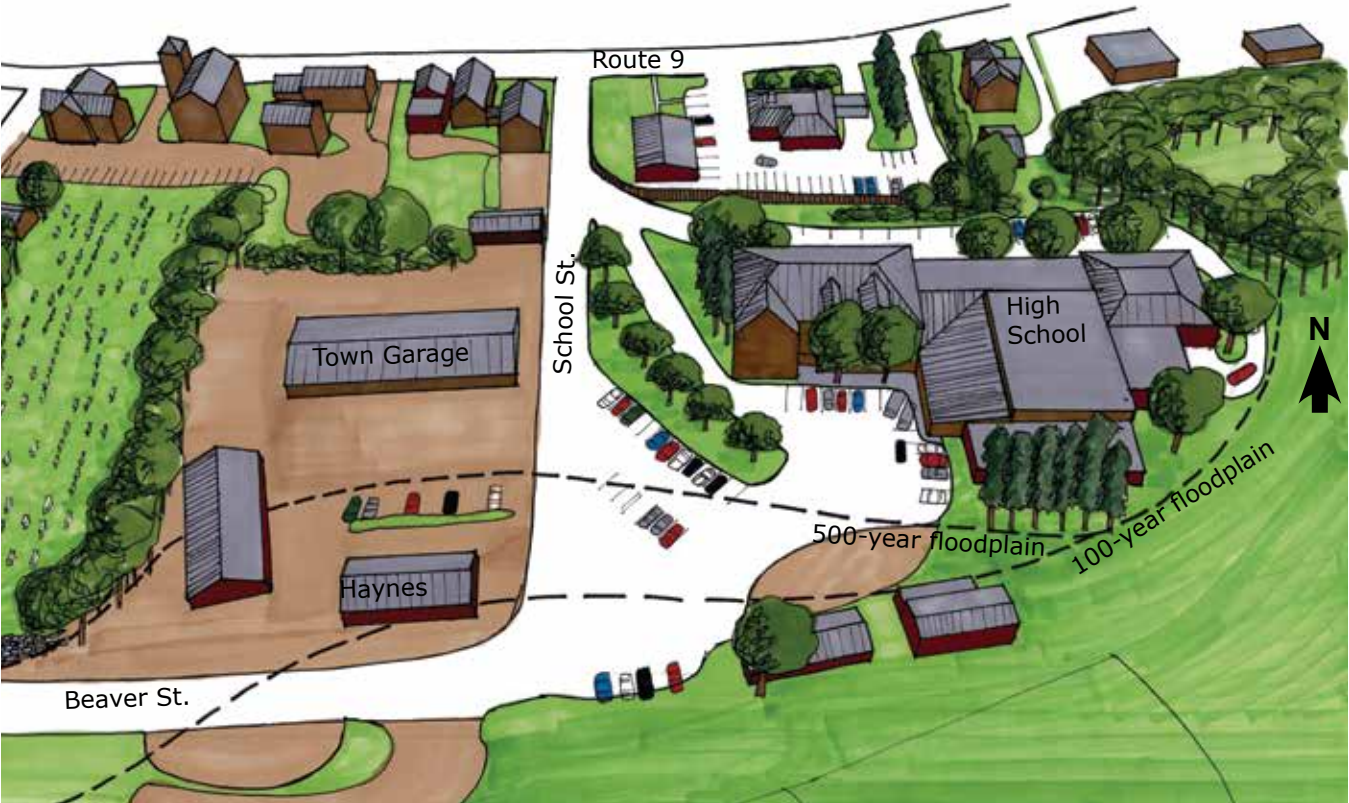
Cons

- Area is limited by cemetery and floodplain and is smaller, only about 5 acres. This site offers limited room to expand.
- This area slopes 3-8% down to the floodplain, meaning that parts of the area may not be universally accessible.

The southeastern area has been chosen to represent a potential future for the village in the following pages.

VISION: NEW VILLAGE CENTER

Existing Conditions



The former town garage and high school site has significant potential for future development. The site is tucked between the floodplain and Route 9, is currently served by utilities, and contains suitable vacant land for building. It is located 0.2 miles from the main intersection and is an easy 5-10 minute walk from the current village center. Because this site is easily visible from Route 9, it may draw visitors passing through town. Unlike the current downtown, much of this area is buffered from traffic noise and exhaust fumes, making it more conducive to pedestrian activity. Within this schematic development concept, parks and parking lots tend to be concentrated in the floodplain, leaving higher ground for mixed-use development.

Phase One: In the first phase, the land is rezoned to allow for a denser, more pedestrian-friendly streetscape in order to make maximum use of the limited buildable area. Streetscape infrastructure is installed to encourage future mixed-use development, including wide sidewalks, shade trees, and a redesigned parking lot. The former high school is converted to a community center with town offices, a community kitchen and gym, and other civic services. A couple of buildings, marked with **A**, are constructed incrementally. The historic C.C. Haynes building, used for agricultural events, is moved across School Street. This opens up space for a park overlooking the ballfields and Beaver Brook and hides the parking lot behind the community center. The adjacent farm shed could also be moved or removed to provide more space for the park and to connect the park to the cemetery. A community garden, not pictured, is located in the floodplain, providing village residents with fresh food.

Phase 2: As the years progress, more buildings, marked by **A**, are added either through new construction or by relocation from the current village center. The larger of the new buildings have flat green roofs to absorb rainwater and lessen storm runoff from the site. (The load capacity should be investigated for existing structures before installing a green roof.) This could serve as a model for new construction throughout the watershed, which would help reduce flooding.

The dashed lines on the maps show the furthest extents of the 100- and 500-year floodplains.

Phase One



Phase Two



VISION: NEW VILLAGE CENTER

Phase Three



Phase Two



Phase Three: In the third phase, a vision for an expanded village center comes to fruition. Four auto-oriented buildings along Route 9, marked by **B** in Phase Two, are removed to create space for mixed-use pedestrian-oriented buildings with parking in the back. These buildings create an attractive streetscape and a gateway to the new village center.

Throughout the new village center, wide sidewalks lined with mature shade trees and active storefronts, marked by **C**, entice local residents and visitors to shop and dine. Several historic buildings are relocated from the floodplain, while other buildings are newly constructed. Residents

have easy access to natural areas for outdoor recreation.

Buildings are gradually moved from the floodplain or lost to flooding in the former village center and those lots are revegetated with edible plants and native floodplain species. Nature trails wind through the area. Signs mark the former locations of buildings and the area is a favorite destination for picnicking, dog walking, and fishing. Once Wilmington's back was to the river. Now the river is celebrated as a major town asset, and townspeople can rest assured that despite an increase in flood events due to climate change, their lives and properties are safe.



Shade trees, wide sidewalks, and a dense, human-scaled built form in historic Shelburne Falls, MA, create an inviting village to visit. A similar streetscape could be created along School Street.



A new side street could be narrow, like Railroad Street in Great Barrington, in order to provide a pedestrian scale and maximum space for businesses. (Photo: Tim Grafft, Massachusetts Office of Travel and Tourism)



Central greens, like this one in Greenfield, MA, provide space for communities to gather, commemorate significant individuals and events, and create a sense of place.

RENEE LAGUE & KIMBERLY SMITH
The Conway School
Graduate Program in Sustainable Landscape
Planning & Design
www.csl.d.edu Spring 2013

VILLAGE MASTER PLAN
TOWN OF WILMINGTON
WILMINGTON, VT 05363

ENVISIONING THE
FUTURE: PHASE 3

CASE STUDIES: VILLAGE RELOCATION DUE TO FLOODING

Although Wilmington could move buildings out of the floodplain incrementally, there are some towns that have moved all at once. While Wilmington may choose not to go in this direction, relocating a village

Soldiers Grove, Wisconsin



Former village center of Soldiers Grove. (Photo: *Come Rain Come Shine*, 1983)

The village of Soldiers Grove, population 595, lies in a valley among the steep bluffs of the Ocooch Mountains in southwestern Wisconsin. The village center, including nearly 40 commercial and municipal buildings and 22 residences, was formerly located inside a bend of the Kickapoo River. Floods hit in 1907, 1912, 1917, 1935, and 1951.

- **1962:** Congress approved a dam near the top of the river and a levee in Soldiers Grove.
- **1974:** Wisconsin required Soldiers Grove to pass a floodplain zoning ordinance, which limited new building in the business district and severely limited maintenance and repairs to existing buildings. This was an economic blow to the already-struggling community.
- **1975:** The Army Corps of Engineers presented its final plan for a levee. Levee maintenance would have cost the village nearly all of its annual tax revenues. The village decided to use grant money to hire a relocation coordinator instead.
- **1976:** The town decided to relocate.



Flood of 1978. (Photo: Betty France)

- **1977:** The village invested its own funds to purchase a site for the new downtown and began the extension of utilities. Federal agencies were slow to support relocation.

Not everyone favored the move but in 1978, what was then the largest flood in recent history swept through town. With the help of state Senators, the Secretary of the US Department of Housing and Urban Development (HUD) granted the village \$900,000 so relocation could begin. The government provided a total of \$4.4 million and state/local sources provided \$2.2 million to complete the project. The town acquired funding piecemeal for various aspects of the project.

While some buildings were moved, much of the town's building stock was in disrepair and townspeople favored rebuilding in order to promote downtown revitalization.

Soldiers Grove waited 30 years for another large flood, but when 500-year floods hit in 2007 and 2008, the new village was unscathed. A local merchant said, "The recent flood devastation reinforced that we did the right thing. I don't ever want to go through another flood like 1978" (Soldiers Grove: The Floods).

center can be a viable option with grant money from the federal and state government and may be more cost-effective than moving incrementally. Cost estimates are on page 22.

Gays Mills, Wisconsin



Flood of 2008. (Photo: US Army)

Gays Mills is a village of 625 people who live upstream from Soldiers Grove, also along the Kickapoo River in southwestern Wisconsin. Citizens of Gays Mills watched the Soldiers Grove residents move in the 1970s and experienced the devastating back-to-back floods in 2007 and 2008. About 150 of the village's 230 houses lie in the floodplain.

After the flood of 2008, residents voted to ask if FEMA or the state could help them move out of the floodplain. A Long-Term Community Recovery Plan was created to help the town achieve its goal. The town hired a Recovery Manager and a site was chosen for relocation after a detailed study.

Today, new townhouses and single-family homes have been built along with a community commerce center, which houses the library, village offices, a community room, and a community kitchen. A 15,000-square-foot Mercantile Center has been completed as well as the Kickapoo Culinary Center, which is a shared-use kitchen designed to act as an incubator for new food-based businesses.

"If Soldiers Grove had stayed in the floodplain it would have been a stagnant community; it would have still existed, but stagnant. All the new businesses would not have happened if we were still there." - Jerry Moran, Sheriff, in 2007



The library, village offices, and community kitchen share this building completed in January 2013. (Photo: Brad Niemcek)

Partial list of funds received:

- \$4.4 M from the US Housing and Urban Development program (HUD) through the Community Development Block Grant program.
- \$733,205 from FEMA Hazard Mitigation Grants
- \$640,000 from the state Department of Commerce.
- \$200,000 in USDA Rural Business Enterprise and Disaster Assistance grants.
- \$1 million Community Facilities loan for the relocation/reconstruction of a community center.
- Plus other low-interest loans for housing rehabilitation, land acquisition, new infrastructure, and affordable rental housing.

In June 2013, a flood hit the parts of the village that did not decide to move, including buildings on the former main street. About 75 homes flooded, some with water four feet deep. The flood was reported as being higher than the last big flood of 1978 (Brueck).

COST ESTIMATES

These cost estimates include capital improvement projects for the three public space designs, the streetscape (primarily along West Main Street), and the relocation of structures. The design recommendations within the floodplain are either fairly inexpensive (gravel walkways) due to the threat of devastating losses or able to withstand flood conditions (flood-tolerant shade trees).

Because the challenges of the floodplain and the state highway in the existing village center are prohibitively expensive to overcome, it makes sense to invest more heavily in improving the streetscape in the area southeast of the village center and/or the area to the west of the Deerfield River to encourage future development in these areas.

Streetscape Cost Estimates

Item Description	Unit	Qty.	Unit Price	Amount
Streetscape				
Street Trees (including installation)	EA	30	\$900	\$27,000
Rain Garden	SY	90	\$125	\$11,250
Specialty pavement at 8 crosswalks (installed when repaving)	SY	270	\$60	\$16,200
Concrete sidewalk installation	SY	90	\$75	\$6,750
Concrete curb ramp - ADA	EA	4	\$1,000	\$4,000
Convert hardpacked parking lot to lawn (preparation & seed)	LS	1	\$30	\$3,000
Benches	EA	2	\$1,400	\$2,800
Trash and recycling receptacles	EA	2	\$1,000	\$2,000
Capital Improvement Total				\$73,000
Annual maintenance on rain garden and lawn	LS	1	\$600	\$600

The Costs of Moving Buildings

Many of Wilmington’s finest historical structures are within the floodplain. One method of preserving the existing historic structures while protecting them from future flood damage is by moving the structures. The cost of physically moving a structure is highly variable due to many factors, including the size and material of the building and the obstacles between it and its final destination.

Unfortunately, the site conditions of the village may make it economically prohibitive to move many structures unless federal or state grants are received for this purpose. Buildings sited close together on small lots, varied topography, narrow streets, overhanging branches, signs, and utility poles make maneuvering equipment difficult and add to the overall logistical costs of relocation.

Additionally, the permits for moving a structure on a state highway could amount to more than \$10,000, according to Messier House Moving, a company based in Vermont, and result in a day of traffic disruption for each building moved. Further research would need to be done on the load-bearing capacity of the bridge, the amount of space on the street between obstructions, and other logistical details.

Messier House Moving provided ballpark cost estimates for moving Dot’s Restaurant (a small building) and Memorial Hall (a very large one), which were chosen to show the likely range in cost estimates. Messier estimated that moving Dot's would likely fall in the range of \$100,000 to \$150,000, while Memorial Hall would cost roughly \$350,000 to \$425,000. The logistical costs of moving could double those numbers, though efficiencies could also be achieved by moving several structures at the same time. The purchase of new land, a new foundation, infrastructure and utility hookups, and bringing any noncompliant buildings up to code would add to the total cost.

Public Space Cost Estimates

Item Description	Unit	Qty.	Unit Price	Amount
West Main Street Parking Lot				
Trees (2" caliper) (including installation)	EA	23	\$650	\$14,950
Rain Gardens (Two locations, installation & vegetated)	SF	2100	\$14	\$29,400
Walkway (select gravel, 5' wide by 6" deep)	LF	900	\$18	\$16,200
Wheel stops (landscape timber ties with two rebar stakes)	EA	70	\$50	\$3,500
Bike rack	EA	2	\$1,200	\$2,400
Capital Improvement Total				\$66,450
Annual maintenance on rain garden	LS	1	\$300	\$300
Annual maintenance on walkway	LS	1	\$800	\$800

Former Brissette Property				
Trees (2" caliper) (including installation)	EA	2	\$650	\$1,300
Stone seating wall (18" high above ground, plus footing)	LF	115	\$225	\$25,875
Topsoil (Type A, Imported)	CY	42	\$55	\$2,310
Shrubs and ground cover (on terrace)	SF	630	\$4	\$2,520
Walkway and pad (select gravel, 5' wide path & 60 SY pad)	LS	1	\$2,500	\$2,500
Benches	EA	3	\$1,400	\$4,200
Pedestrian lighting	EA	3	\$1,500	\$4,500
Install PVC and wires for lighting	LF	80	\$60	\$4,800
Capital Improvement Total				\$47,985
Annual maintenance on walkway	LS	1	\$400	\$400
Annual maintenance on vegetation			\$1,000	\$1,000

Buzzy Towne Park				
Pavilion	LS	1	\$50,000	\$50,000
Pedestrian lighting	EA	10	\$1,500	\$15,000
Install PV and wires for lighting	LF	600	\$60	\$36,000
Picnic tables	EA	4	\$1,500	\$6,000
Trash and recycling receptacles	EA	2	\$1,000	\$2,000
Trees (including installation)	EA	16	\$650	\$10,400
Naturalize wet meadow (preparation and seeding)	Acres	1	\$7,500	\$7,500
Walkway (select gravel, 5' wide by 6" deep)	LF	1000	18	\$18,000
Capital Improvement Total				\$144,900
Annual maintenance on gravel walkway	LS	1	\$800	\$800
Annual maintenance on native meadow	LS	1	\$300	\$300

Note: Estimates given include product and installation. They do not include design and administration fees, taxes, mobilization, or contingency fees.

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MATERIAL & DESIGN PRECEDENTS



Solidly built benches are located below shade trees in Brattleboro, VT.

These material and design precedents could help improve the pedestrian experience, public safety, streetscape appeal, and ecological health in and around Wilmington. Choosing quality products that are in keeping with the village's character can enhance its distinctiveness and sense of place. Besides installation costs and visual appeal, products should be chosen for

their durability to withstand the conditions they may be subjected to, for future maintenance and cost requirements, and for their ecological impact.



A rain garden installed in a parking lot stores and infiltrates stormwater. Overflow basins, elevated nine to twelve inches above the lowest point in the rain garden, may be installed to divert water during large storm events.



Stamped, colored asphalt at the Food Co-op in Brattleboro, VT, communicates to drivers that they are entering a pedestrian zone. Wilmington could use a specialized asphalt on crosswalks, particularly at the entrance points in town to help slow traffic.



Wide sidewalks create an inviting streetscape for pedestrians to stroll and shop in Easthampton, MA.



Deciduous trees create a comfortable microclimate year-round by providing shade in the hot summer months, while allowing most light through in the winter months when the tree has lost its leaves. Care must be taken to leave at least twenty-five square feet of non-compacted, porous surface around trees to reduce tree stress and the risk of tree roots buckling the pavement. Trees also need water to reach their roots. Permeable pavers, structural soil, and other porous materials help improve tree survival rates.



This sign in the village of Montague, MA, gives a strong sense of place and history. In a similar vein, a distinctive wooden sign with changeable nameplates could be used to direct visitors to businesses in town.



A diversity of vegetation offers a changing display of color throughout the seasons. Plants may be selected for their edible or medicinal properties, allowing the public to harvest.



Streetlights with a distinctive historic charm would enhance the town's mid-nineteenth-century feel. This streetlight in Brattleboro, VT, uses super-efficient LED bulbs, offering significant energy and cost savings over the streetlight's lifetime.



In Acadia National Park, gravel pathways are an invitation to enjoy a pleasant stroll. Stone walls bordering the path add a rustic appeal. Wilmington could improve connectivity throughout the village with a similar network of inviting pathways.



Pavilions offer protection from both sun and rain, and can be a valuable community asset. A pavilion at Buzzy Towne Park could offer beautiful views of Beaver Brook and encouraging public gatherings.

PLANT PALETTE

The following palette includes a selection of plants suitable for varying locations within Wilmington village. With the exception of three adaptable, small street trees, all plants listed are native to the northeastern United States (**non-native species). Native vegetation is best adapted to the conditions of the local region, while providing valuable wildlife and insect habitat. Plants selected for roadsides, the West Main Parking Lot, and the former Brissette residence should be tolerant of harsh conditions such as road salt, soil compaction, and pollutants. Plants selected for locations within the floodplain should be adapted to wet or wet mesic conditions. Choosing a diversity of species enhances visual interest and improves the resiliency of the plant community if one or more species falls into decline for any reason.

*Key to Suitable Locations:
S = Street Trees
W= West Main Street Parking Lot
R = Former Brissette Residence
B = Buzzy Towne Park
G = Rain Gardens

Common Name	Scientific Name	Height	Spacing	Light Requirements	Suitable Locations*	Comments
Trees						
Hedge Maple**	Acer campestre	25'-35', to 70'	>20'	Sun to light shade	S, R	best in drier sites out of floodplain
Red Maple	Acer rubrum	40'-60', to 120'	>40'	Sun	S, W, R, B, G	
Downy Serviceberry "Robin Hill"	Amelanchier arborea	15'-25', to 40'	>20'	Sun to partial shade	S, W, R, B, G	
River Birch	Betula nigra	40'-70', to 90'	>35'	Sun to partial shade	W, R, B, G	
American Hornbeam	Carpinus caroliniana	35'-50', to 65'	>20'	Sun to shade	S, W, R, B	
Common Hackberry	Celtis occidentalis	30'-60', to 100'	>25'	Sun to full shade	S, W, R, B	
Green Ash	Fraxinus pennsylvanica	50'-60', to 80'	>30'	Sun	S, W, R, B, G	exotic emerald ash borer may be a problem
Thornless Honey Locust**	Gleditsia triacanthos	30'-70', to 100'	>30'	Sun	S, W, R, B	can have insect and disease problems
Amur Maackia**	Maackia amurensis	20'-30', to 45'	>20'	Sun	S, W, R	
Sycamore	Platanus occidentalis	75'-100', to 150'	>55'	Sun	W, B	
Swamp White Oak	Quercus bicolor	50'-60', to 70'	>35'	Sun	W, B	
Shrubs						
Black Chokeberry	Aronia melanocarpa x Iriquois Beauty	2'-5', to 10'	4'	Sun to full shade	W, R, B, G	edible berries, suckers profusely, adaptable
Summersweet	Clethra alnifolia	3'-8'	4'-6'	Sun to partial shade	W, R, B, G	good for shady, wet sites
Redosier Dogwood	Cornus sericea	7'-9'	6'-8'	Partial shade	W, R B, G	adaptable
Northern Bayberry	Myrica pensylvanica	5'-12'	4'-6'	Sun to partial shade	W, R	adaptable, use for borders and massing
Common Elderberry	Sambucus canadensis	5'-12'	6'-8'	Sun to partial shade	W, R, B	edible berries
Herbaceous						
Swamp Milkweed	Asclepias incarnata	up to 48"	24"-36"	Sun	W, R, B, G	wet to mesic soils
New England Aster	Aster novae-angliae	up to 48"	18"-24"	Sun to partial shade	W, R, B, G	wet to dry mesic soils
Eastern Purple Coneflower	Echinacea purpurea	up to 48"	24"-36"	Sun to partial shade	W, R, B, G	wet mesic to dry mesic soils
Boneset	Eupatorium perfoliatum	up to 48"	18"-24"	Sun to partial shade	W, R, B, G	wet to wet mesic soils
Sweet Joe-Pye Weed	Eupatorium purpureum	up to 84"	36"-48"	Sun to full shade	W, R, B, G	wet mesic to dry mesic soils
Blue Flag Iris	Iris virginica	up to 36"	24"-36"	Sun to partial shade	W, R, B, G	wet to mesic soils
Great Blue Lobelia	Lobelia siphilitica	up to 36"	18"-24"	Sun to partial shade	W, R, B, G	wet to mesic soils
Wild Lupine	Lupinus perennis	up to 24"	12"-15"	Sun to partial shade	W, R, B, G	dry mesic to dry soils
Monkey Flower	Mimulus ringens	up to 24"	12"-18"	Sun to partial shade	W, R, B, G	wet to wet mesic soils
Common Ironweed	Vernonia fasciculata	up to 72"	18"-24"	Sun to partial shade	W, R, B, G	wet mesic to mesic soils
Grasses & Rushes						
Little Bluestem	Andropogon scoparius	up to 36"	24"-36"	Sun to partial shade	R, G	mesic and dry soils
Blue Joint Grass	Calamagrostis canadensis	up to 48"	24"-36"	Sun to partial shade	W, R, B, G	wet to mesic soils
Fowl Manna Grass	Glyceria striata	up to 36"	15"-18"	Sun to shade	W, R, B, G	wet to mesic soils
Common Rush	Juncus effusus	up to 24"	18"-24"	Sun	W, R, B, G	wet to mesic soils
Switchgrass	Panicum virgatum	up to 48"	36"-48"	Sun to partial shade	W, R, B, G	wet mesic to dry soils

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MAP DATA ATTRIBUTION

Unless otherwise indicated, the maps in this document are for planning purposes only. Maps were created using data from multiple sources. These include:

- Vermont Center for Geographical Information (VCGI)
- Jeff Nugent, Windham Regional Commission
- Original data produced by authors

All analysis maps use the same data sources.

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