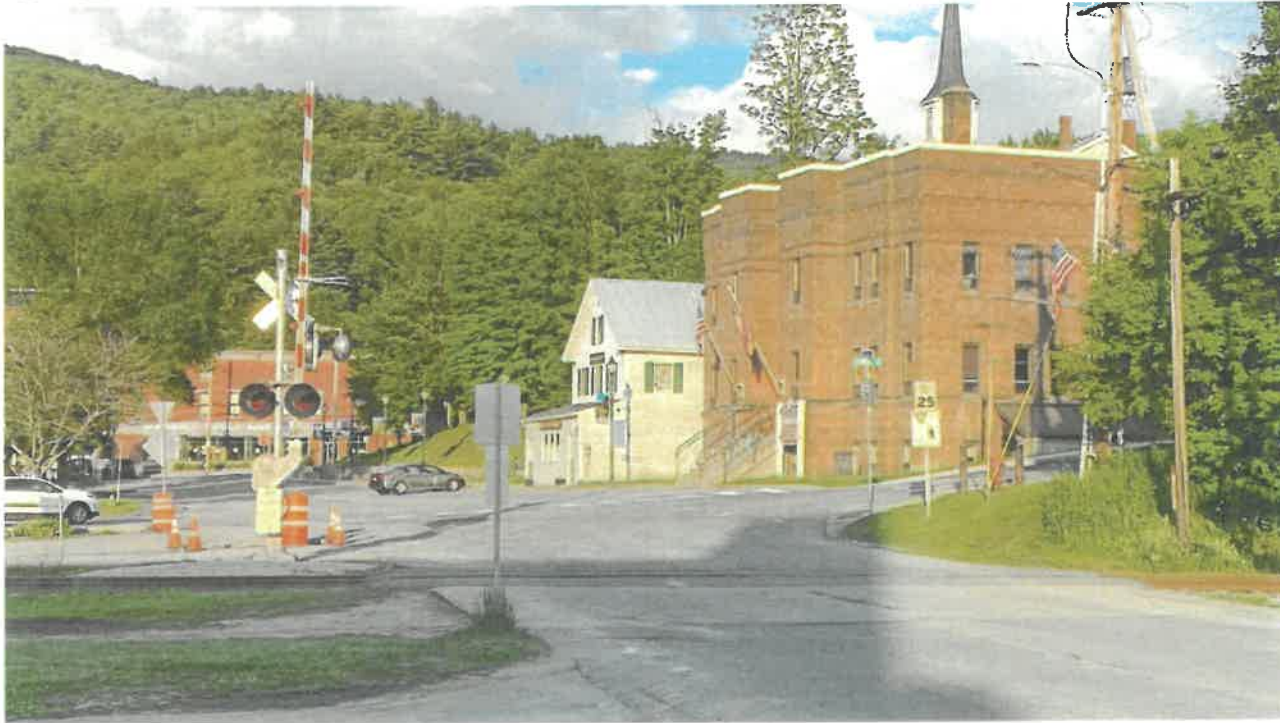


# NORTHFIELD PEDESTRIAN SCOPING STUDY



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This project, CA0718, has been funded in part by the Federal Highway Administration and the Town of Northfield, through the Vermont Agency of Transportation (VTrans) Municipal Assistance Section (MAS).





# Introduction



# Project Overview

There is a vocal desire for enhanced pedestrian connections in Northfield, VT. This project is a response to that desire, and explores creating a new pedestrian connection in the center of Northfield.

## Project Area

The project area includes Wall Street, and Water Street from the intersection with Dog River Park to the south end of Dog River Park, mapped to the right. The area includes, and is surrounded, by homes, stores, and restaurants.

## Project Goal

To explore the feasibility of creating a safer pedestrian route from the Town Common to Dog River Park along Wall Street, crossing the railroad tracks and Dog River. Wall Street offers the most direct east-west pedestrian path in this area of Northfield, connecting residents to key amenities east and west of the river, such as the Senior Center, Brown Library, and Dog River Park.

With the upcoming 2026 construction of the Main Street Bridge, detoured traffic will temporarily increase on Wall Street, heightening the need for a safe pedestrian path. Currently, the project area lacks sufficient sidewalks, has missing curb cuts, and no formal railroad crossing on Wall Street.

Enhancing pedestrian infrastructure will enable residents and visitors to access community resources without cars, promoting physical activity, autonomy for non-drivers, and reducing car dependency. This aligns with the Vermont Global Warming Solutions Act (2020) and Vermont Comprehensive Energy Plan (2022) goals of reducing car dependency and lowering greenhouse gas emissions.

## Prior Work

Relevant prior work affecting the project area

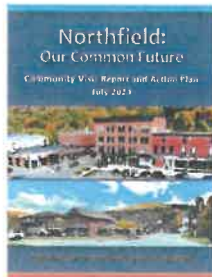
includes the Northfield Municipal Plan (2020), the Northfield Community Visit Report and Action Plan by the Vermont Council on Rural Development (2023).

The Northfield Municipal Plan states in it's section on transportation objectives:



*“Objective 2: Provide transportation facilities and services that will allow people to travel into, out of and within Northfield by means other than private motor vehicles”*

And the Northfield Community Visit Report and Action Plan states:



*“Common Future Pories: Improve Accessibility, Walkability, and Pedestrian Safety” by improving “the safety and accessibility of roads, paths, and village centers... through the expansion of sidewalks and crosswalks, traffic calming strategies, and... ADA accessibility of walking paths and the village center.”*

The result of this project is a concept design in the project area which supports both of these objectives.





# Wall Street Preferred Alternative



In this design, a 5 foot sidewalk has been added along the north of Wall Street. The sidewalk is partly directly on the road, separated by curbing, and partly set back from the road, separated by curbing and a planting strip. For the section immediately west of the fire station, the sidewalk is adjacent to the road, separated by curbing

On Depot Square, the existing crossing of 88 feet has been reduced to 61 feet through the addition of two bump-outs. These two bump-outs both narrow the crossing distance, and create a pedestrian refuge that puts pedestrians in better view of turning vehicles, while also separating them from the road through curbing.

In this design the existing crosswalk by the Northfield Senior Center is further to the west. Moving this crosswalk west places it closer to the entrance of the Senior Center. The new crossing location also avoids sending pedestrians to cross the parking lot east of 170 Wall Street, as happens under current existing conditions.

This alternative also proposes a formalized railroad crossing, illustrated in section to the right. Under existing conditions, pedestrians cross the railroad wherever suits them best, as there is no formalized crossing location.



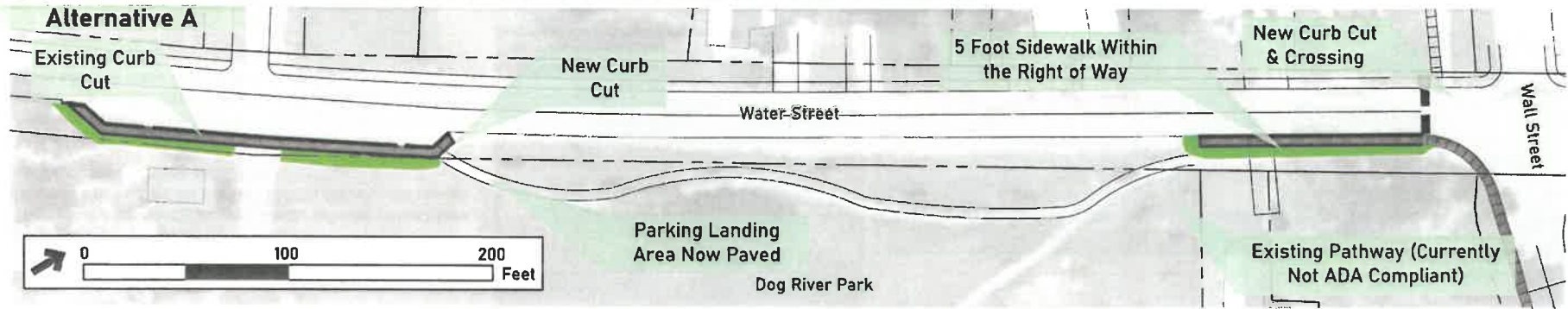
*The existing railroad "crossing". In this design, this crossing is formalized, and separated from the road*



*Image above: the existing railroad, without a crossing for pedestrians. Image below: section of the proposed solution*



# Water Street Preferred Alternatives A & B



This design adds a new crossing and curb cut the intersection of Water and Wall Street, connecting Wall Street to the existing sidewalk network on the west side of Water Street. This design also adds a formal, 5 foot sidewalk between the intersection and the entrance to Dog River Park, creating an official path where there currently is none.

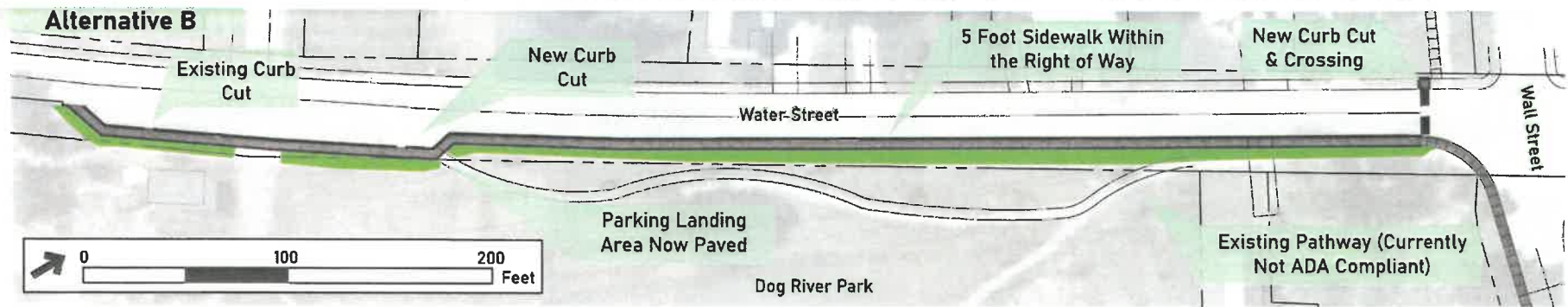
This proposed 5 foot sidewalk would connect to the existing

hardpack pathway in the park. Notably, this existing path is not ADA compliant. To address this accessibility problem, several options were considered, and Alternative B (below) was chosen as the most appropriate solution. For more on the process that led to this conclusion, see "Post-Public Feedback Alternatives Evaluation" on page 33.

This design also adds a paved and curbed area adjacent to the

parking at Dog River Park, and adds an extra curb cut for easier access to the park.

Stormwater improvements would likely be required as a part of this design alternative; while specific improvements are not identified at the stage, they are included in the Opinion of Probable Construction Cost. There is existing storm drain and inlets located on the west side of Water Street.



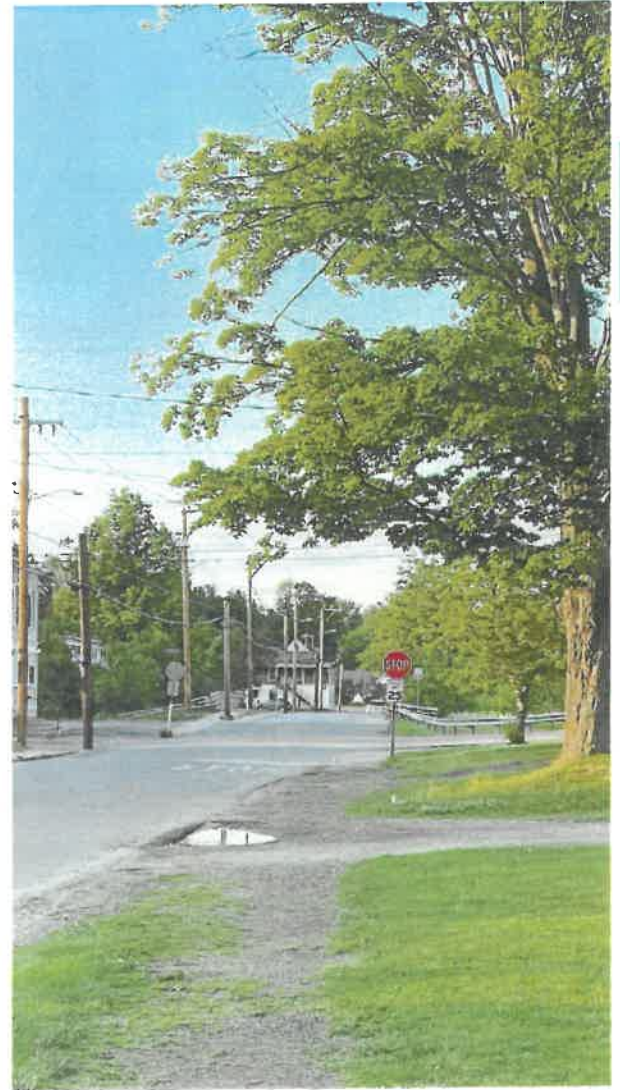
Design B is the same as Design A, with the addition of a curbed, five foot sidewalk within the right of way. This addition could be part of the original installation, could be a later addition, or could be skipped over altogether. These options are explored more in the "Design Strengths & Impacts" sections in the "Preferred Design Alternatives" chapter (page 33). Stormwater improvements would

likely be required as a part of this design alternative; while specific improvements are not identified at the stage, they are included in the Opinion of Probable Construction Cost. There is existing storm drain and inlets located on the west side of Water Street.





# Existing Conditions





# Land Use and Zoning

## Current Land Use

The east side of the project area is within Northfield's Village Center. This designation comes from the Vermont Agency of Commerce, and denotes historic centers to be supported with training and financial incentives to "bring additional public and private investment to spark village revitalization." (*State of Vermont Agency of Commerce and Community Development. "State Designation Programs."* Vermont.gov, June 26, 2024, <https://accd.vermont.gov/community-development/designation-programs>.) It is a developed area with numerous buildings close to each other, with a blend of residences and businesses. Notable buildings in the project area include the Northfield Senior Center, the Green Mountain Apartments, and Northfield Pharmacy. There are two areas of public green space in the project area: Dog River Park, and the Town Common. The Town Common specifically hosts several community events through the year, including a Labor Day celebration, and the Northfield Farmer's Market.

## Zoning

The project area is a mix of residential and commercial districts. Specifically, the project area includes portions of the following districts: Industrial, High Density Residential, and Village Center.

The intent of these districts is as follows:

### Industrial:

This district is reserved for mixed commercial and manufacturing uses.

### High Density Residential:

The intent of the High Density Residential District is to support moderate to high density residential units near and in the Downtown. Homes are allowed by right, but so are other uses, including ADUs, retail stores, offices, and restaurants (under conditional use.)

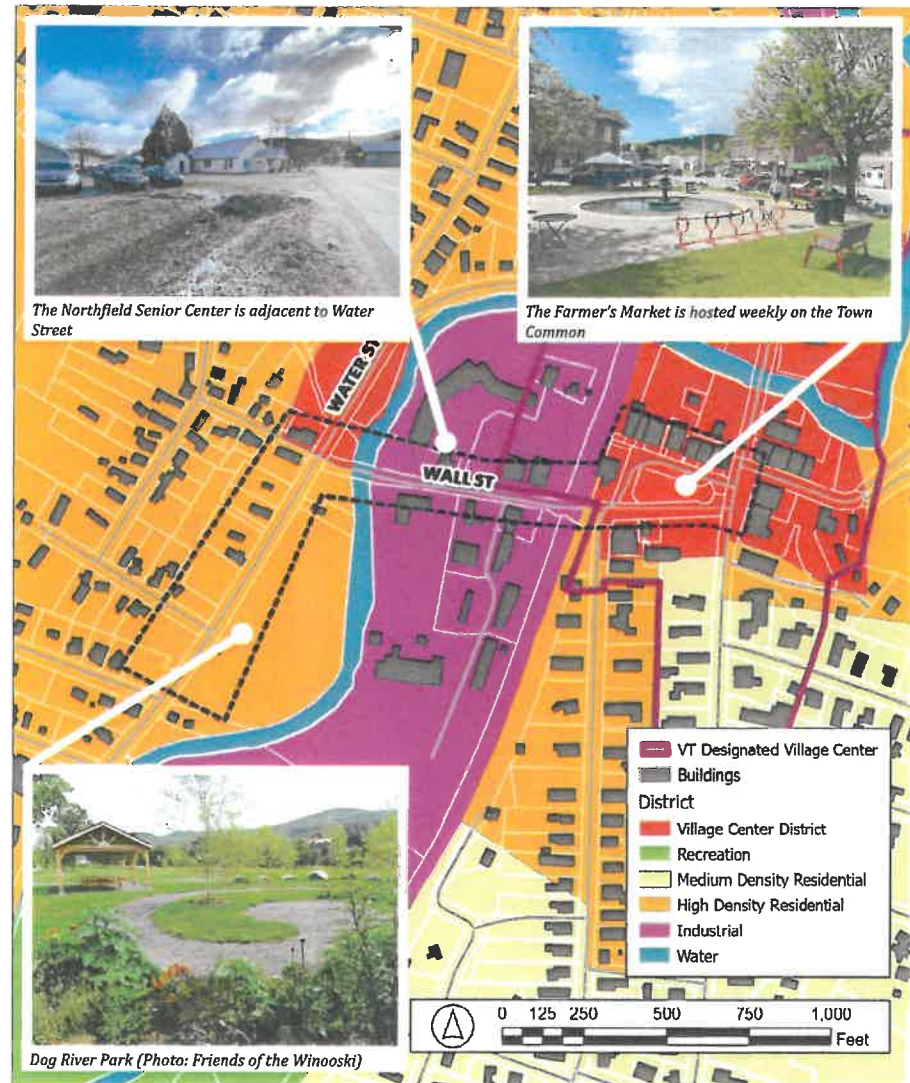
### Village Center:

\*The intent of the Village Center District is to maintain the downtown Village Center with special conditions based on historic characteristics that support retail, commercial, and high density residential uses, centered on the village common as a public gathering area. **An additional goal is to regulate and maintain downtown walkability and pedestrian access.**

(*Bylaws for the Regulation of Land Use in the Town of Northfield, Vermont.* Northfield, VT, 2017. <https://www.northfield-vt.gov/zoning-1>)

## The Takeaway

The project area is a mix of residential and commercial spaces, and is located in an area of Northfield with specific goals to increase commercial development, residential density, and pedestrian access. The project area connects many Northfield residents with services and activities. This suggests that there is a need for pedestrian infrastructure to connect all of these resources and destinations in the project area, and that where pedestrian infrastructure is found to be lacking, it should be improved.

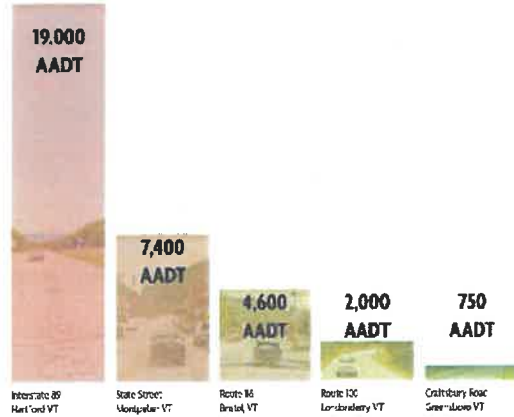




# Roadway Characteristics

## Street Volume

There is currently no Average Annual Daily Traffic (AADT) report for the two streets in this survey area, Water Street and Wall Street. The 2022 AADT for the nearby section of N Main St/ VT 12 just east of the project area was 5,490 vehicles per day.



Graphic comparing various levels of AADT

## Roadway Condition

The roadway condition in the proposed project area is good-to-fair. The road is mostly smooth, with occasional cracks. Roadway paint is in decent condition, but is showing signs of wear.

## Sight Lines

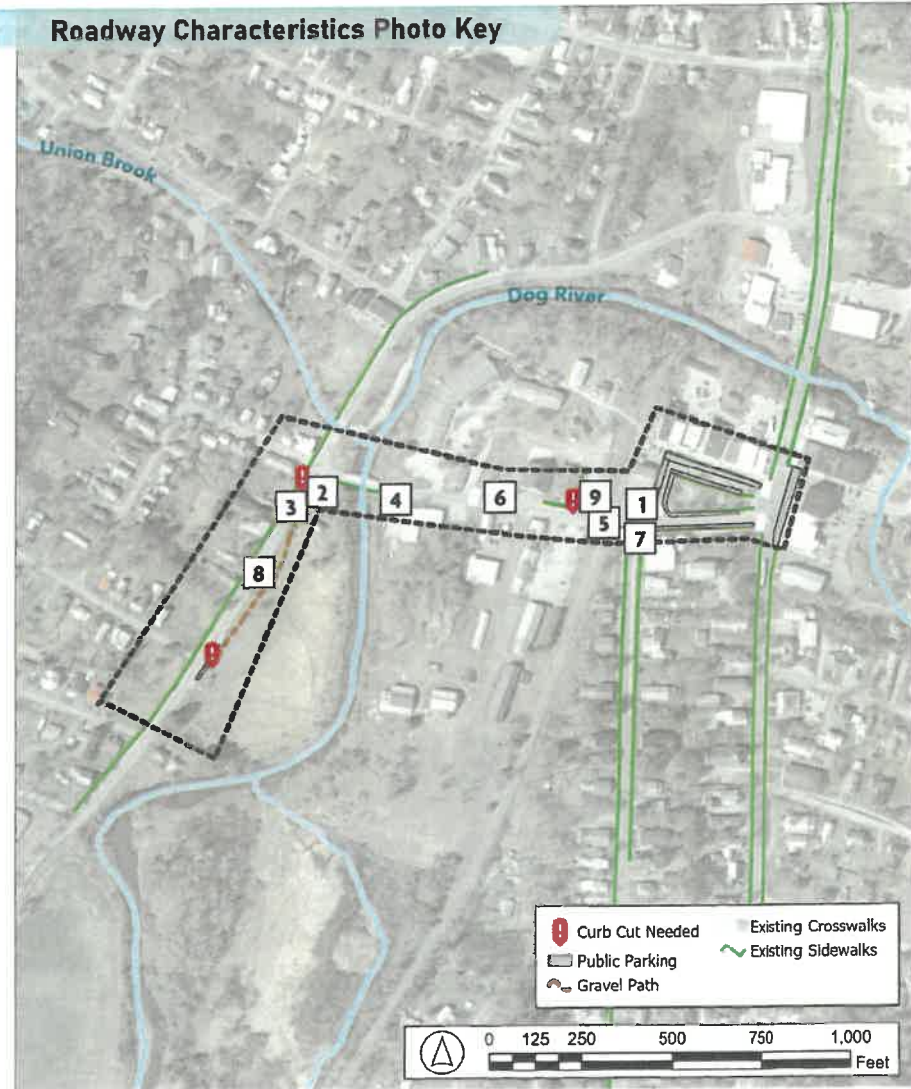
For drivers in the project area, lines of sight are relatively clear, owing to the straight streets and a lack of physical barriers. However, this is not the case in the eastern edge of the project area in the Depot Square off Wall Street. In this area, there are many public parking spots, shops, a sitting green with trees, and pedestrians moving between them

all. The resulting area contains many spaces for pedestrians, including children, to be out-of-sight for drivers, who may be otherwise distracted looking for parking.



Wall Street is flat, straight, with clear lines of sight

## Roadway Characteristics Photo Key



# Roadway Characteristics (continued)

Sight lines are also partly obscured at the Wall Street Bridge, at the intersections of Water and Wall Streets. The roads are mostly flat except for this bridge, which is slightly elevated and blocks sight lines to and from this intersection.

## Pedestrian Facilities and Crosswalks

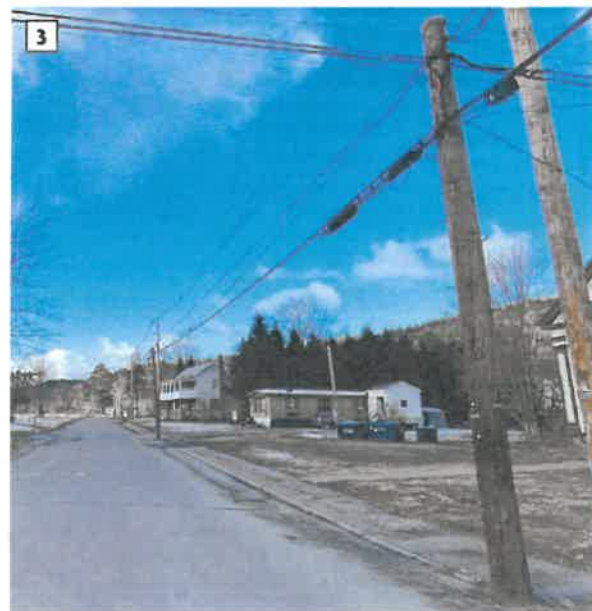
The existing sidewalks and crosswalks are mapped on the previous page. For most of Wall Street, there is no sidewalk, although there are two crosswalks, one of which connects two areas lacking sidewalks. There is a stretch of Wall Street with sidewalk on the bridge spanning the Dog River in fair condition, with some cracks and divots on its eastern edge. There is also a stretch of sidewalk in front of the police station, although the curb cut on its eastern side is inside the parking lot, rather than along the path of travel at the parking lot entrance.

On Water Street, there is a sidewalk in fair-to-poor condition on the western side. On the east side of Water Street, there is a gravel path that runs through Dog River Park. This path has been noted by the community as difficult for people who use mobility devices.

There are several pedestrian destinations within the project area, including shops, restaurants, an American Legion post, and the Town Common with seating and a fountain. Just southeast of the project area is the Brown Public Library. At the western part of the area is Dog River Park, a public greenway



The gravel path in Dog River Park can be hard to use for those with mobility differences



Existing sidewalk on the west side of Water Street



Existing sidewalk on the Wall Street Bridge



Photo of Wall Street illustrating the lack of sidewalks



This Wall Street crosswalk connects two sides of the street without sidewalks





# Roadway Characteristics (continued)

with walking paths along the Dog River. There is also a small parking area next to Dog River Park, although the landing area for the parking spots is hardpack, and only has one curb cut. Connected to all of this via Water and Wall Streets are numerous residences and the Northfield Senior Center.

## Bicycle Facilities

There are no bike lanes or official bicycle facilities within the project area, with the exception of a single bike rack on the Town-Common.

## Curb Cuts

There are three locations in the project area where either a curb ends abruptly without a curb cut, or where the lack of a curb cut could impede a people using wheelchairs, walkers, or strollers. These locations are in front of the police station, at the Dog River Park parking area, and at the intersection of Wall and Water Streets, and are called out on the map on page 13.

## Two-Way and One-Way Streets

The streets within and adjacent to the project area are open to two-way traffic, with the exception of Depot Square. Depot Square, as shown on the map to the right, operates as a one-way oval, encircling the Town Common.

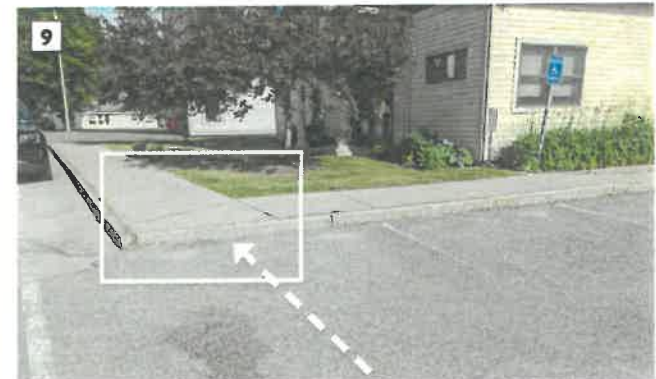
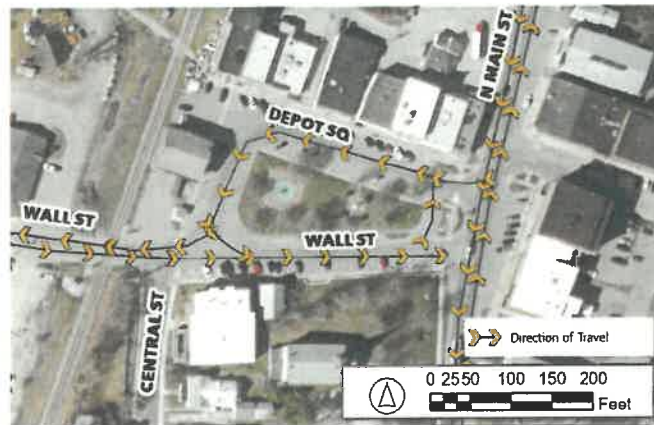
Notably, the south side of Depot Square, which is currently a one-way, will temporarily be converted to a two-way street in 2026, due to a construction project in the area. This change will presumably cause an increase in traffic in the project area as vehicles are re-routed from Main Street to Wall Street.



There is no formal pedestrian crossing at the intersection of the train tracks and Wall Street



There is only one curb cut next to the Dog River Park parking area, and the landing area is not paved



One of the only sidewalks on Wall Street—in front of the Police Station—does not have a curb cut near the flow of pedestrian traffic

# Roadway Characteristics (continued)

## Intersections and Access Management

This area contains several intersections. Several of these intersections have wide crossing widths, which can present challenges for users with certain mobility differences. The shortest crossing in the project area is 37 feet, while the longest, the intersection crossing at Depot Square, is 88 feet. There is also a road intersection with the railroad tracks on Wall Street. At this intersection, there is no defined walker or wheeler crossing, leaving people crossing wherever best suits them.

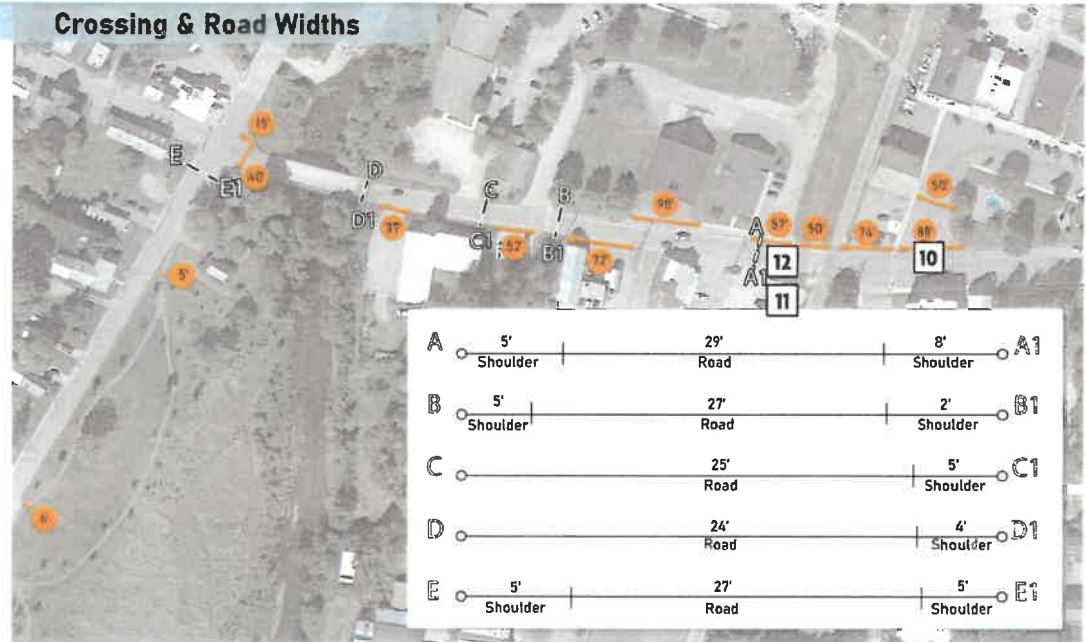
The three road entrances to the project area are north/south via Water Street, Central Street, and Main Street. The intersection of Wall and Water Streets is a four-way intersection, enforced by three stop signs, with traffic traveling west from Wall Street given priority. There are additional stop signs where Wall Street intersects with Main Street to the east.

## Railroad

The existing railroad crossing is currently established for cars only, with no sidewalk or separated space for pedestrian crossing. It does include signals and arms to block the road. It is owned by the New England Central Railroad and is the route of the Amtrak Vermonter. There was a fatality in 2019 to the north of Wall Street when a man fell on the tracks.

Representatives from the Town of Northfield held a meeting with the railroad representatives in February 2024 during which they discussed the feasibility of upgrading the Wall Street crossing to include a pedestrian crossing within the signals. The railroad supported the idea with the suggestion to replace the entire crossing, including the roadway, be replaced and updated in concrete. They also recommended relocating the signal on the north side of the tracks to be more in line with the existing sidewalk in front of the police station and adding additional signage for the pedestrian crossing.

Crossing & Road Widths



The crossing at Depot Square is 88 feet, and driver's approaching this intersection may be distracted as they look for parking.



The driveway entrance crossing east of Napa Auto Parts is 33 feet



The driveway entrance at the police station is 57 feet



# Roadway Characteristics (continued)

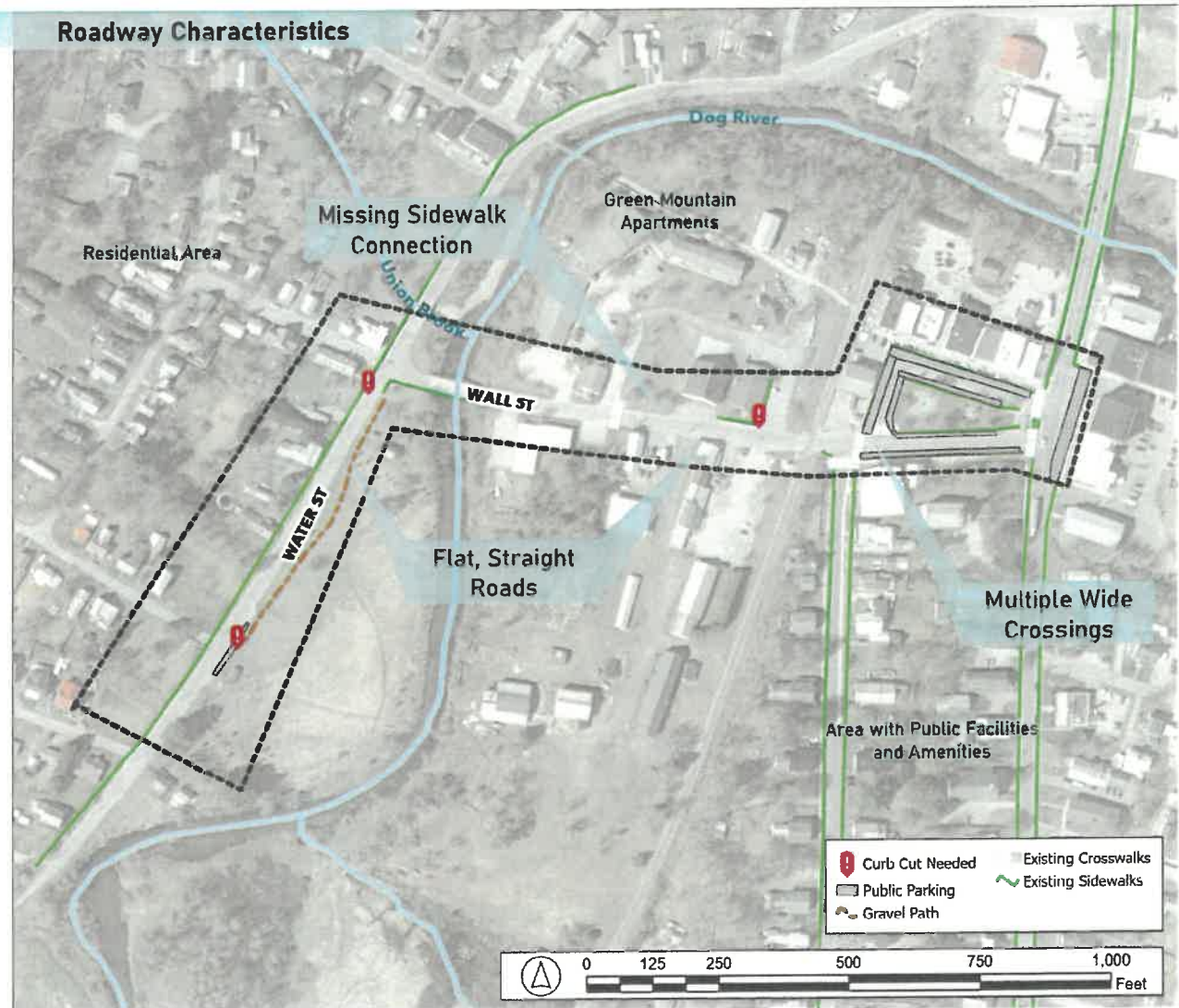
## The Takeaway

Two notable challenges in the project area are a lack of defined pedestrian refuge and wide crossing areas.

On a trip from one side of the project area to the other, pedestrians can expect to travel on the shoulder of the road, particularly along Wall Street, rather than on a defined path. This space is unprotected from the road by neither a curb nor a vegetated buffer, leaving travelers more exposed to passing vehicles. The exception to this occurs in three locations: in front of the police station, on the Wall Street bridge, where there are existing sidewalks, and along Water Street, where there is a path through Dog River Park on one side, and a curbed sidewalk on the other. It is relevant to note that the path through Dog River Park is difficult to use for people who use wheelchairs, and that the sidewalk on the other side of the road has no crosswalk connecting it to Wall Street. Vehicles sharing Water Street with pedestrians may also be encouraged to drive faster than the street's 25 MPH speed limit, owing to the flat, straight road giving drivers a good line of sight, and a false sense of confidence.

A second challenge in the project area is the length of crossings. Street crossings as well as driveway crossings in the project area can be incredibly long. A typical driveway width is 22 feet, however the shortest crossing in the project area is 37 feet, while the longest, the intersection crossing at Depot Square, is 88 feet. During these crossings, travelers are exposed to moving vehicles, with whom they share the space. For travelers with mobility differences, or those traveling with small children, moving across such large distances with speed may be difficult, leaving them exposed to moving vehicles for a longer period of time. Additionally, the long crossings mean travelers have to move for longer periods without taking breaks, something that may be difficult for some users, including older adults, children, or people pushing strollers.

Coordination with the railroad will be required in advance of and during final design and construction.



# Roadway Data

## Safety data

According to the VTrans Public Crash Data Query Tool, there have been 15 reported vehicle crashes from October 2013 through October 2023. A third of those occurred where Main Street borders the eastern edge of the project area.

## Public transit

Green Mountain Line #93, the Northfield Commuter, connects the communities of Northfield and Montpelier Monday through Friday. The line runs north south, along the eastern boundary of the project area. There is a bus stop within the project area, near the police station. Formerly, this bus stop was located at the Depot Square Intersection, as noted to the right.

## Road Class

Both Wall and Water Streets are Class 3 Town Highways.

## Right of Way

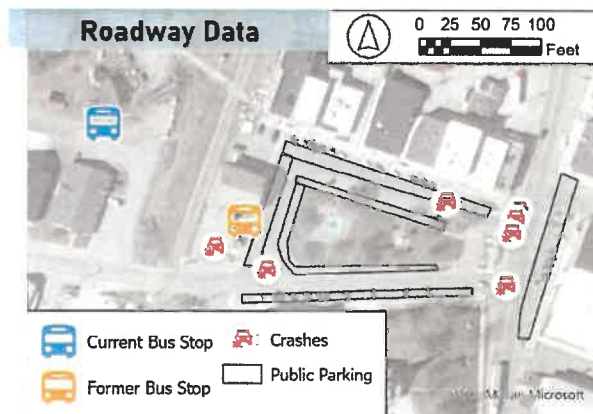
The right of way for Water Street is 49.5 feet. For Wall Street, most of the road has a right of way of 35 feet. However, this increases at the intersection with the rail road tracks to a maximum width of 77.5 feet (see graphic.)

## The Takeaway

Although vehicle crashes in the project area are relatively few, they are notably concentrated around the Town Common. This area, with its public parking, suggests that drivers might be distracted while searching for or leaving parking spots, leading to more crashes. Additionally, the widest pedestrian crossing in the project area is at the intersection of Depot Square and Water Street, placing pedestrians in vehicular space for longer periods. This overlap of high accident rates and a long pedestrian crossing may increase the danger for pedestrians.

Additionally, more pedestrians may be drawn to this area to use the bus service, versus a comparable location without a bus stop.

Finally, the ample right of way along Wall and Water Streets may provide enough room for off-road pedestrian paths to be built.



The former bus stop, now behind the police station



# Existing Utilities

## Stormwater

The Dog River bisects the project area, and the contours of the land that feeds it affect the stormwater movement. The project area has little change in elevation so water moves slowly across the project area, eventually joining the Dog River. There is a closed network of storm drains, as shown in dark blue. These are mostly confined to the north side of the Wall Street and the west side of Water Street, with some crossings to inlets on the opposite side.

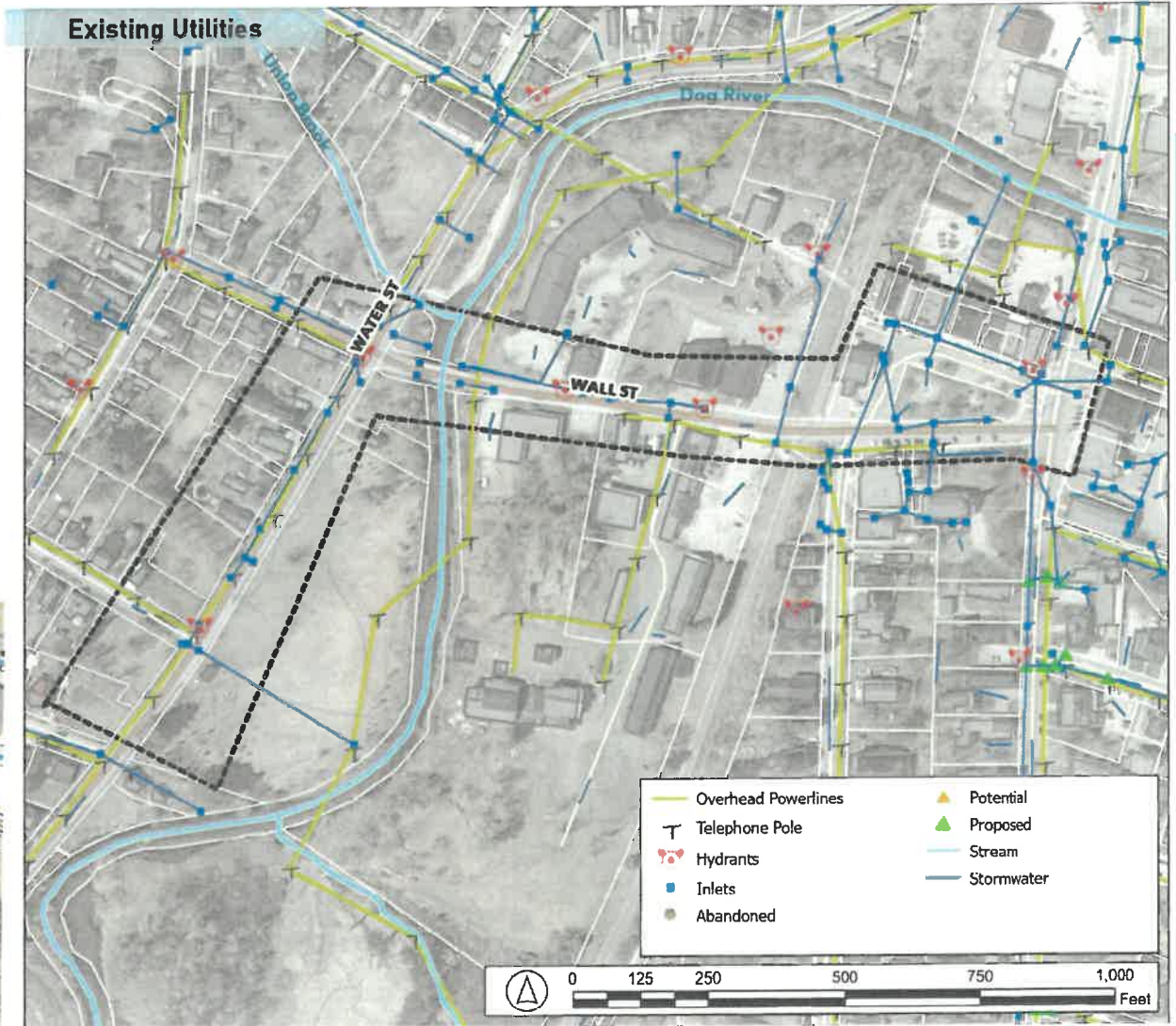
## Overhead Utilities

There are overhead utilities and associated poles along the southern side of Wall street. The utility line spans east-west from Gillespie Fuels to Central Street. There is also overhead lines spanning north-south across Wall Street just west of the bridge.

## Water and sewer

Water and sewer are located throughout the extents of the project area with two hydrants directly within the project area. According to Town records, these are 6' below the surface.

## Water and Sewer





# Environmental Resources

## Overview

As part of the preparation for this scoping study, a desktop environmental analysis of the study area was done. The results of that study are summarized in the table to the right and on the map below.

## The Takeaway

The addition of pedestrian walkways in the project area is unlikely to affect the nearby environmental resources. The exception to this is Dog River Park, which serves as a functioning floodplain and is in a Flood Hazard Area. More on Dog River Park's stormwater functions is discussed in the **Alternatives Section** of this document.

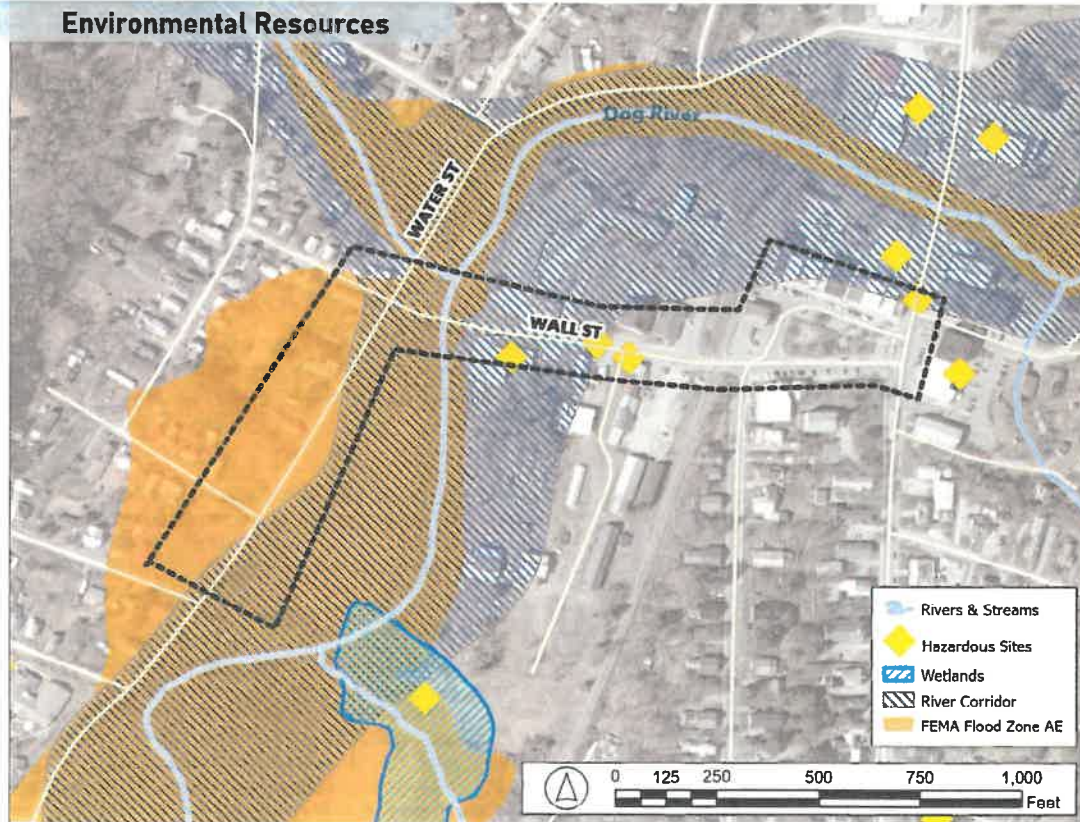


Table 1: Environmental Resources	
Wetlands	There are wetlands southeast of the project area near Dog River Park, but none within the project area.
Waterbodies	The Dog River bisects the project area and is spanned by a bridge in the project area on Wall Street. A small, unnamed stream flowing into the Dog River is south east of the project area.
River Corridor	The river corridor for the Dog River encompasses the western half of Wall Street and portions of Water Street. It does not come into the town green area, but skirts along its northern edge.
FEMA Flood Hazard Areas	A flood hazard area encompasses all of Water Street and the eastern most part of Wall Street. This "AE" flood area is defined by FEMA as having a 1% annual chance of flooding.
Endangered Species	There have been no element occurrences (EO) of a rare, threatened, or endangered species in the project area.
Forest Land	There is a reserve forest riparian buffer along the Dog River which intersects with a portion of Wall Street. Extensive areas of tree canopy lie to the east and west of the project area.
Hazardous Sites	There are three hazardous sites within the project area, and another three just to the east of the project area, as well as a hazardous waste generator.
Flora and Fauna	No species of note observed.





# Cultural Resource Review

## Historic Resources

### Inventory (HRI)

According to an HRI performed by Polly Seddon Allen, Senior Architectural Historian, there are four historic properties in the Project Area. Additionally, Depot Square itself is a Vermont State Register-listed Historic District (listed on 3/5/1990), as is Water Street, as a part of the Water-Pleasant Streets Historic District (listed on 3/15/1990.) See the map on the following page for resource locations in the project area.

#### Property #1: The Vermont National Guard Armory at 61 Wall Street

This building was constructed in 1922 in the town's Depot Square Historic District, and was documented as contributing to the district's significance due to its "monumental form and early twentieth century community associations". While this property is not currently on the National Register for Historical Places (NRHP), its Vermont State Register standing indicates that it may be eligible for being added to the NRHP.

#### Property #2 The Vermont Central Railway Depot at 70 Depot Square

This property is listed on the NRHP as of 4/1/1975, and is a historic property under Section 106 of the National Historic Preservation Act (NHPA). The two-story brick building was built in 1852. This property's NRHP listing includes the Depot Square Green, also known as the Northfield Town Common. The 70 Depot Square building and the Town Common are together considered one historic property.

#### Property #3 324 Water Street

This property has been documented as contributing to the Water-Pleasant Streets Historic District because of its "design and community associations." The property has not been evaluated for addition to the NRHP, but its contribution to the Historic District indicates it may be registry eligible.

#### Property #4 362 Water Street

This property has been documented as contributing to the Water-Pleasant Streets Historic District because of its "design and community associations," and was built in 1900. The property has not been evaluated for addition to the NRHP, but its contribution to the Historic District indicates that it may be eligible for addition to the registry.

For the full HRI, see Appendix B.

## Archaeological Resources Assessment (ARA)

According to an ARA performed by Charles Knight, Ph.D. of Crown Consulting Archaeology, LLC, there are no known archaeological sites within or adjacent to the Project Area. Crown Consulting did, however, identify one area as 'archaeologically sensitive.' The area—the southeast corner of the intersection of West and Wall Streets—is in a residential yard immediately south of the Wall Street bridge crossing. Additionally, Wall Street cuts through the former railway yard of the Central Vermont Railway, a site that included numerous large buildings. As a result, it is possible the basal portions of these structures still exist under 2-3 feet of fill below



Property #1: The Vermont National Guard Armory at 61 Wall Street



Property #2 The Vermont Central Railway Depot at 70 Depot Square and the Town Common (above)



Property #3 324 Water Street



Property #4 362 Water Street



# Cultural Resource Review (continued)

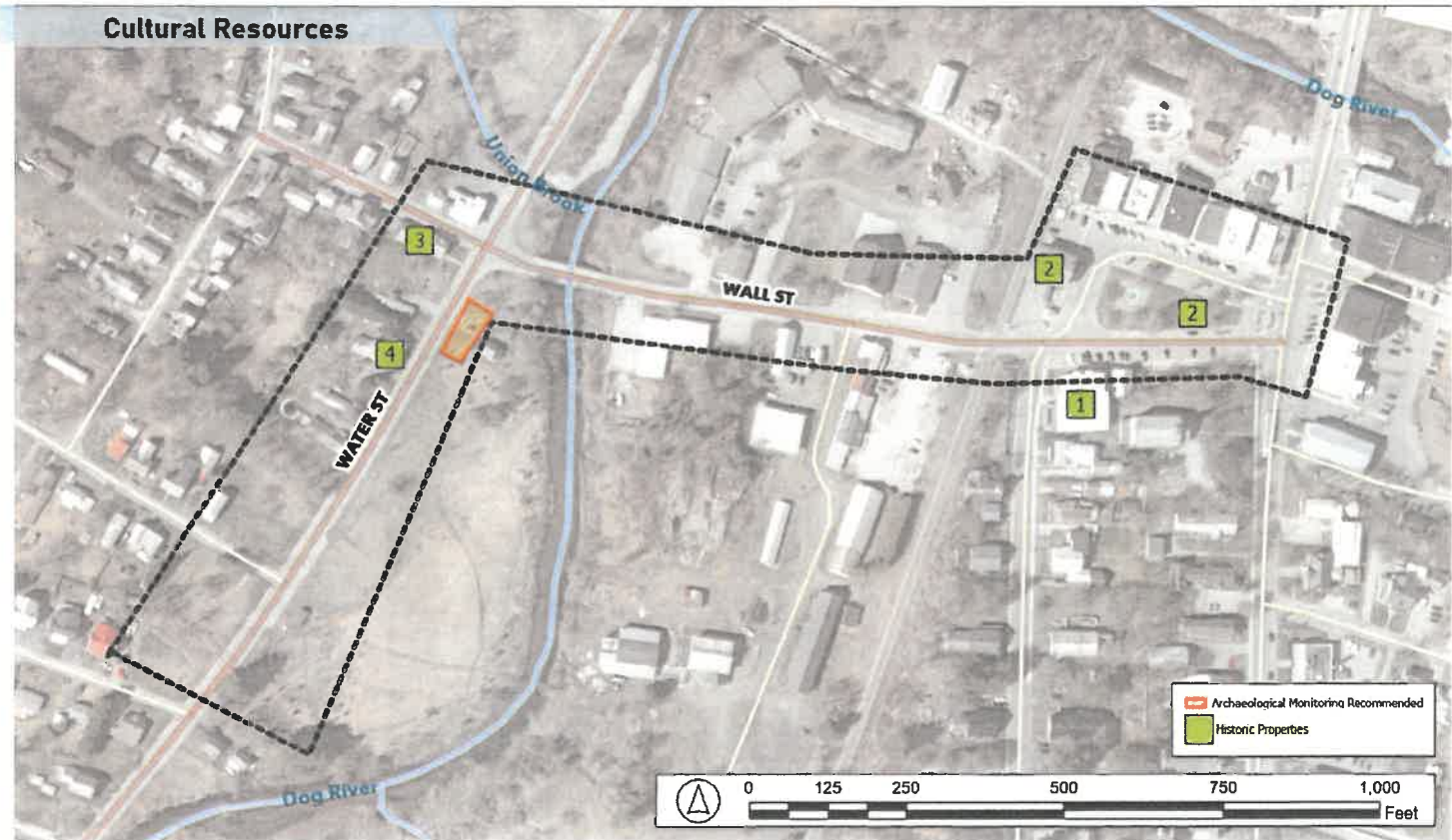
Wall Street and its margins.

Because of these areas, Crown Consulting recommended additional archaeological study for any project whose activities require excavating more than 1-2 feet along the east side of Water Street from the Wall Street bridge immediately south in front of the last remaining residence. Barring this specific case, Crown recommended no further archaeological study in the Project Area.

For the full ARA, see Appendix C.

## The Takeaway

Documented historical and archaeological resources in the project area are unlikely to be impacted by a street-adjacent pedestrian path. There is a small area where archaeological monitoring is recommended on Water Street (see map right), but monitoring would only be necessary in the event final site designs called for excavation greater than 1-2 feet.





# Public Engagement

## Local Concerns

On November 16th, 2023, 12 members of the Northfield community attended a Local Concerns meeting to discuss pedestrian infrastructure on Wall and Water Streets. Over the course of this two-hour discussion, several community concerns emerged.

### 1. Senior and Residential Access

Participants emphasized the importance of safe routes for seniors using the Senior Center and residents of Green Mountain Apartments to Depot Square.

### 2. Accessibility Issues

Some participants noted that the intersection of Water and Wall Street is missing a crosswalk and a curb cut. It was also noted that the sure-pack path in Dog River Park is not easily used by people using wheelchairs, particularly in wet conditions.

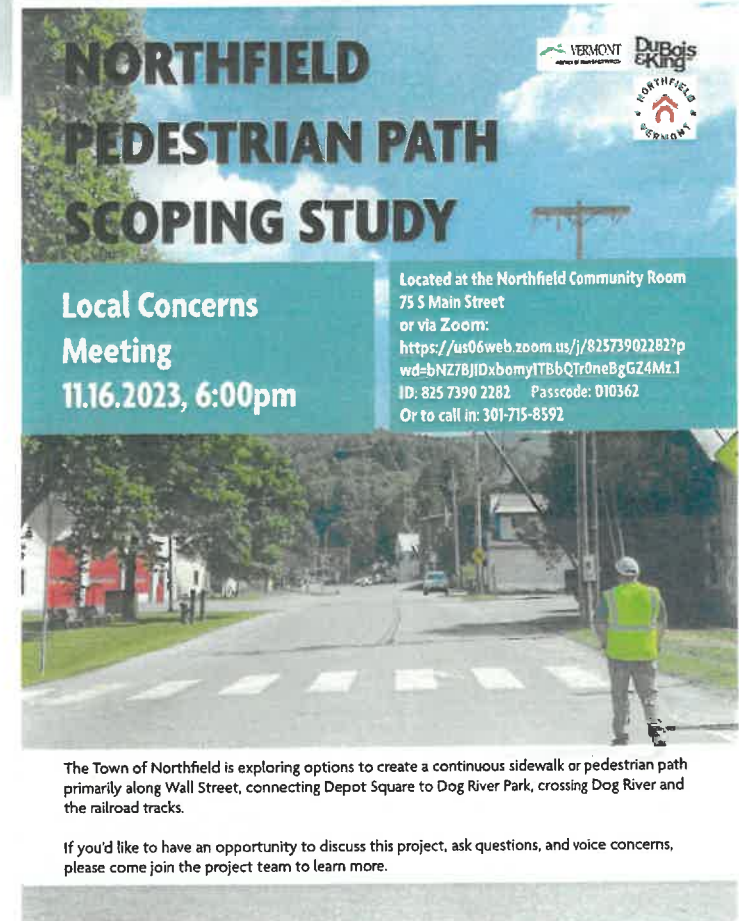
### 3. Design Suggestions

It was noted that a sidewalk set back from the road would be preferred, but that any sidewalk would be better than nothing.

### 4. Wide crossings

The crossing at the entrance to the police station and the crossing at the intersection of Depot Square and Wall Street were both noted as being particularly wide for pedestrians. There was a question about the possibility of narrowing these crossings without limiting vehicle movement.

An Alternatives Meeting was held on March 26, 2024 and is discussed on page 30.



The poster features a blue sky background with a utility pole. It includes logos for Vermont Agency of Transportation, Dubois & King, and Northfield Vermont. The text reads: 'NORTHFIELD PEDESTRIAN PATH SCOPING STUDY', 'Local Concerns Meeting 11.16.2023, 6:00pm', and provides location and Zoom details. Below the text is a photograph of a street with a crosswalk and a worker in a safety vest.

**NORTHFIELD PEDESTRIAN PATH SCOPING STUDY**

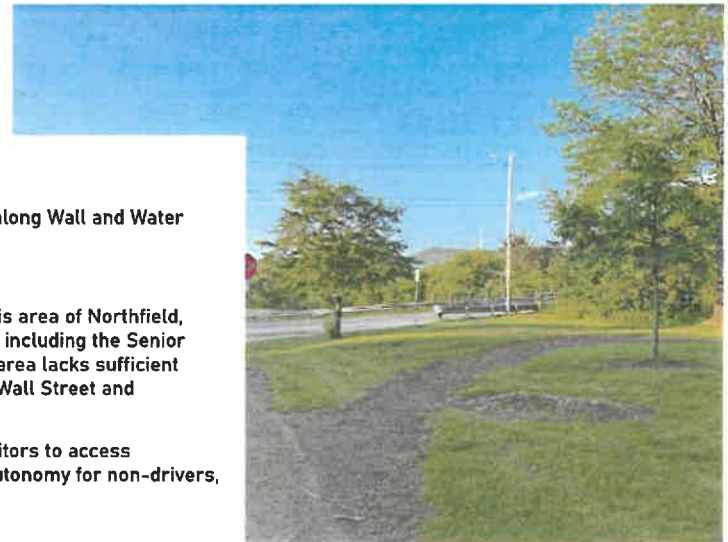
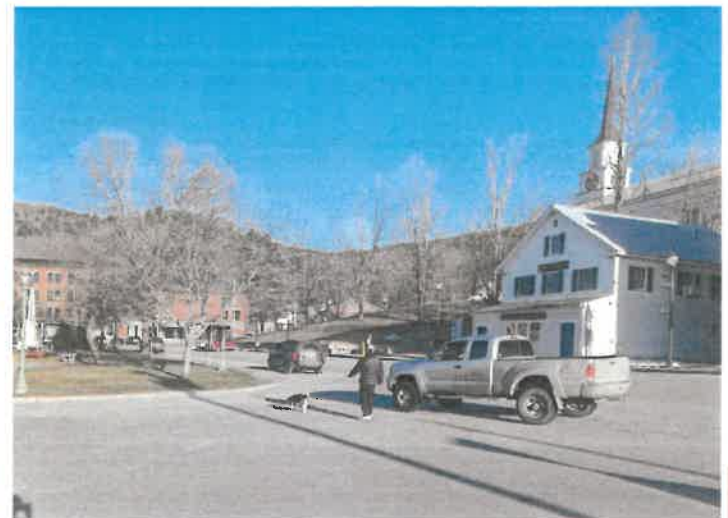
**Local Concerns Meeting**  
**11.16.2023, 6:00pm**

Located at the Northfield Community Room  
75 S Main Street  
or via Zoom:  
<https://us06web.zoom.us/j/82573902282?pwd=bNZ7BJJDxbomyTTBbQTr0neBgZ24Mz.1>  
ID: 825 7390 2282 Passcode: 010362  
Or to call in: 301-715-8592

The Town of Northfield is exploring options to create a continuous sidewalk or pedestrian path primarily along Wall Street, connecting Depot Square to Dog River Park, crossing Dog River and the railroad tracks.

If you'd like to have an opportunity to discuss this project, ask questions, and voice concerns, please come join the project team to learn more.

# Purpose & Need



## **Purpose**

The purpose of this project is to improve pedestrian connectivity along Wall and Water Streets in Northfield, VT.

## **Need**

Wall Street offers the most direct east-west pedestrian path in this area of Northfield, connecting residents to key amenities east and west of Dog River, including the Senior Center, Brown Library, and Dog River Park. Currently, the project area lacks sufficient sidewalks, has missing curb cuts, no formal railroad crossing on Wall Street and prohibitively wide road crossings.

Enhancing pedestrian infrastructure will enable residents and visitors to access community resources without cars, promoting physical activity, autonomy for non-drivers, and reducing car dependency.





# Design Alternatives



These concepts illustrate potential design solutions to address the safety and comfort of pedestrians moving on Water and Wall Streets. Each Preliminary Design identifies a way to link Dog River Park to Depot Square and the surrounding areas. Each concept has strengths and weaknesses, which are addressed. For the purposes of future development phasing, Water and Wall Streets have been separated, and are each shown with their own series of preliminary designs.

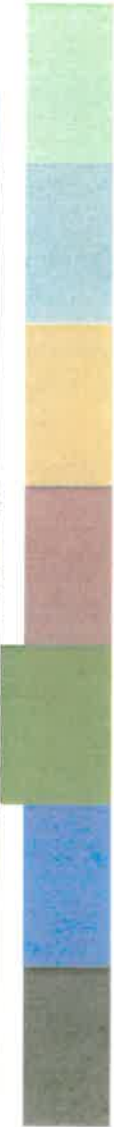
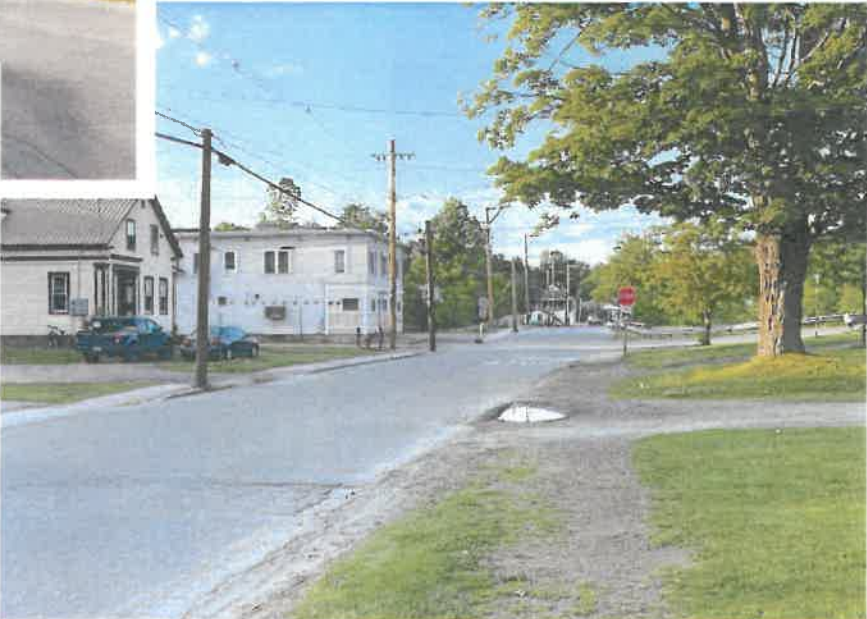
The first Preliminary Design—Preliminary Design 0— is a “no-build” concept. This design represents a scenario where no-changes are made to the project area (pertaining to the scope of this project) except for typical maintenance of existing infrastructure. The No-Build option is a requirement of the VTrans Scoping process.

The following pages provide an overview of each Preliminary Design, their conceptual costs, potential improvements, and potential impacts.



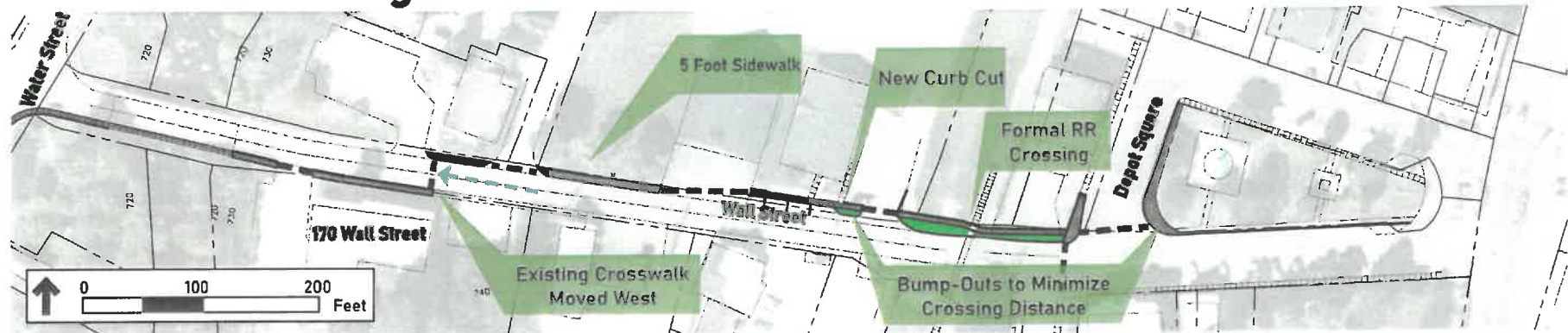
# Design Alternative 0: No-Build

The no-build option equates to no upfront capital costs, as nothing in the project area concerning pedestrian infrastructure will change. No upfront capital costs does not mean no costs, however. In a no-build scenario, residents in and near the project area will move about as they always have; walking, wheeling, or driving as each suits them. Future costs or impacts like the potential danger of walking along a road in a busy area, residents without cars having limited access to the area around them, and the additional greenhouse gas emissions from residents using their cars to travel when they might otherwise have not will all continue to exist.





# Wall Street Design Alternative 1



In this design, a five foot paved path has been added along the north side of Wall Street. The path is partly adjacent to the road, separated by curbing, and partly set back from the road, separated by curbing and a planting strip.

In Depot Square, the existing crossing of 88 feet has been reduced to 61 feet through the addition of two bump-outs. These two bump-outs both narrow the crossing distance and create a pedestrian refuge that puts pedestrians in better view of turning vehicles, while also separating them from the road through curbing.

The existing crosswalk by the Northfield Senior Center has been moved further west. Moving this crosswalk places it closer to the entrance of the Senior Center, and also avoids funneling pedestrians to cross the parking lot of 170 Wall Street, a 52 foot crossing.

This design includes a formalized railroad crossing. Under existing conditions, pedestrians cross the railroad wherever suits them best, as there is currently no formalized crossing location.

## Design Strengths

By adding a sidewalk separated from the road, this design gives pedestrians a protected refuge from vehicles on Wall Street and Depot Square.

Additionally, by moving the Wall Street crosswalk further west, this design helps pedestrians avoid crossing the parking lot for 170 Wall Street. The existing crosswalk is orientated in such a way that pedestrians must cross the 170 Wall Street parking lot. All together, there are seven parking lot entrances on Wall Street, and this design avoids all but two. Of those two, the fire station crossing is unaltered from existing conditions (for emergency vehicle access) but the other crossing, at the police station, has been shortened from 57 feet to 30 feet with the addition of a bump-out.

Likewise, the street crossing at Depot Square has also been shortened from 88 feet to 61 feet with the addition of two bump-outs. Shortening these crossing distances has two benefits: firstly, the shorter crossing distances minimizes the time users are in the path of traffic. Secondly, by shortening this crossing, pedestrians are more centered in a vehicle driver's "cone of vision". This cone represents the width of vision drivers have while in their vehicles. The further to the periphery people or objects are, the less likely a driver is to be able to see them.



*The existing crossing at Depot Square*



*The designed alternative*

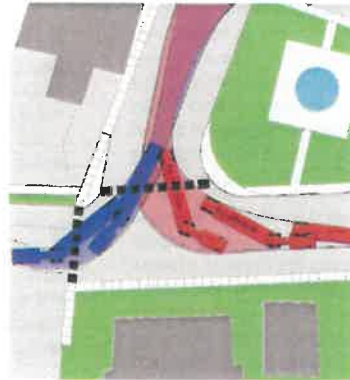
# Wall Street Design Alternative 1 (continued)

## Design Impacts

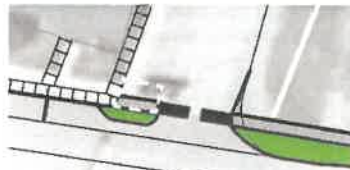
Narrowing the Depot Square crossing and the entrance to the Police Station parking lot will impact vehicles traveling through those areas. As part of the design process, a desktop analysis of the narrowed crossings' geometry confirmed that this would not impede vehicle movement, including the large trucks that often stop in Depot Square to make deliveries.

One parking space will need to be removed at the police station, to make room for the new bump-out and curb-cut.

The most complicating factor for this design is the location of a fire hydrant and three ash trees on the edge of Wall Street to the west of the fire station. The gap between the fire hydrant and the trees is small enough that if a planted strip were to be added between the road and the sidewalk the fire hydrant would need to be moved. Public feedback supported avoiding the ash trees, which are threatened in Vermont by the Emerald Ash Borer. Moving the fire hydrant would be an additional expense. Because of these physical limitations, three sub-alternatives were added to this design, specifically to address the question of how to move about the fire hydrant and trees.

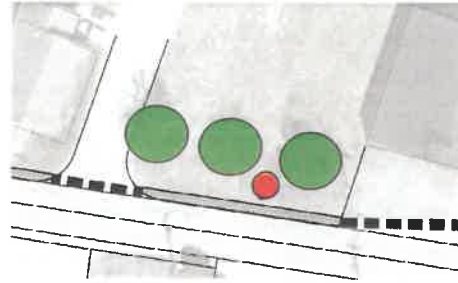


Desktop review of truck turning radii in Depot Square



To make room for this bump-out, one parking space at the police station will be removed

● = Existing Fire Hydrant   ● = Existing Ash Tree

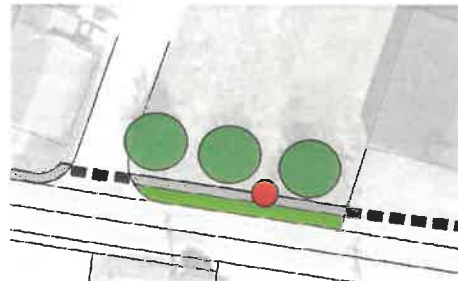


**Sub-alternative A:** Straight sidewalk adjacent to the road.

The most straightforward alternative of the three presented here. This alternative gives pedestrians a separate path off the road, protected by curbing. It avoids impacting both the location of the fire hydrant, as well as the ash trees. Of the three designs, this is the one that puts pedestrians closest to the road.

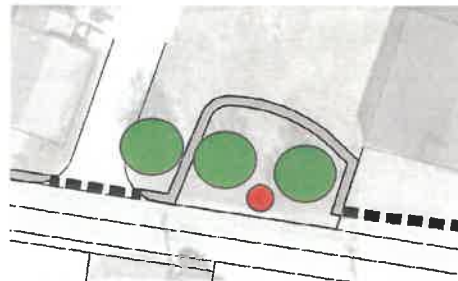


The fire hydrant and ash trees



**Sub-alternative B:** Straight sidewalk with planted buffer.

This alternative has the benefit of separating pedestrians from the road further than a sidewalk right next to it, which may be a more enjoyable experience. The inclusion of a planted strip pushes the sidewalk north into the fire hydrant. Moving the sidewalk further north would put it in danger of affecting the ash tree roots. The greatest impact of this alternative is the cost of moving the fire hydrant.

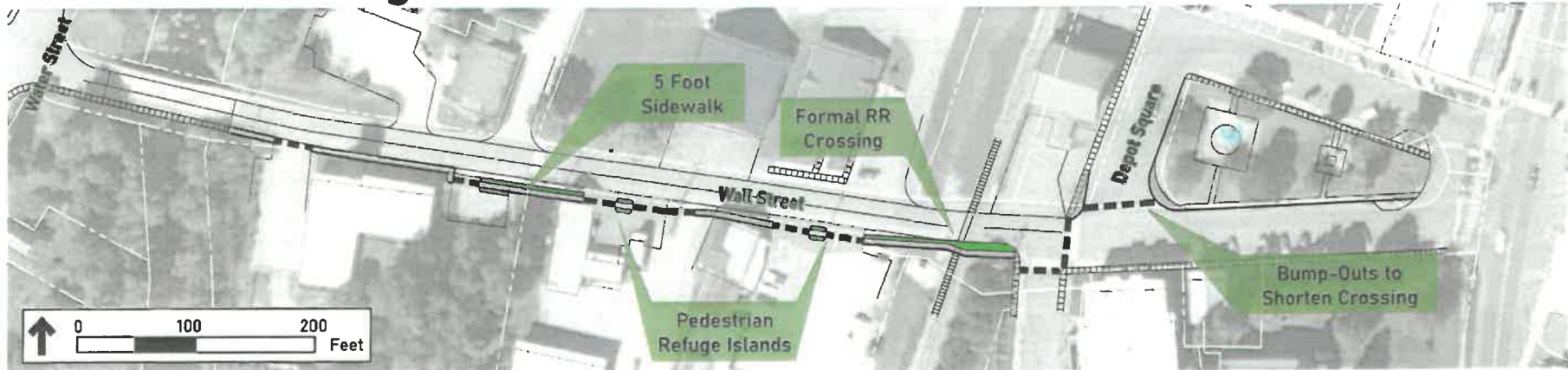


**Sub-alternative C:** Curved sidewalk, set back behind the trees.

This alternative provides pedestrians the most separation from the road and strives to reduce impacts to the trees and avoids the fire hydrant. It is also likely a more expensive option than A, because of the additional materials to create the longer path. Additionally, during public review there was concern that such a configuration would be ignored by many users, who would instead opt to take the shorter path along the road, creating a "desire path".



# Wall Street Design Alternative 2



This design adds a 5 foot sidewalk to the south side of Wall Street. Part of the sidewalk is separated from the road with a planting strip, and part is curbed adjacent to the road. The sidewalk crosses four driveways/ parking lots on Wall Street. Two of these driveway crossings have refuge islands halfway across, where pedestrians can rest as they cross while being separated from vehicles by planted, curbed islands

The crossing at Depot Square has been narrowed from 88 feet to 62 feet via the addition of two curbed bump-outs.

A formalized railroad crossing has been added on the south side of Dept Square.

## Design Strengths

As with Wall Street Design 1, this design provides pedestrians a protected path from Depot Square to the west end of Wall Street.

Also as in Wall Street Design 1, this design narrows the crossing at Depot square, shortening the time pedestrians are in a vehicle area. Unlike Wall Street Alternative 1, this design does not add any new street crossings, meaning the path of travel along Wall Street is more similar to the existing conditions the community may be used to, when compared to Wall Street Alternative 1. This alternative also avoids the fire hydrant and ash trees on the north side of Wall Street.



Image above: to provide a resting place for pedestrians while they cross wide the wide driveway entrance east of Napa Auto Parts, a pedestrian refuge island is proposed, similar to one found on the east side of Depot Square (pictured below)



# Wall Street Design Alternative 2 (continued)



## Design Impacts

A notable weakness of this alternative is the four driveway/ parking lot crossings the sidewalk crosses. The narrowest of these crossings is 26 feet, while the widest is 52 feet. As pedestrians cross these lots, they are moving in spaces shared with vehicles. Movement within these areas increases the chances of being struck by a vehicle. Such proximity to moving vehicles would likely detract from sidewalk users' comfort, lessening the overall travel experience.

An additional weakness of this alternative is the location of the sidewalk in relation to utilities in the area. There are five telephone poles on the south side of Wall Street, and several underground stormwater pipes. Placing the sidewalk on this side of the road will likely impact these utilities, adding to the overall disruption during construction.



Image above: the existing railroad crossing on Wall Street. Image below: the designed alternative, adding sidewalk to either side of the crossing and a dedicated pedestrian crossing surface.





# Depot Square Crossing Alternatives

Three crossing alternatives were initially explored on the western end of Depot Square. These included crossing at the southern corner, the northern corner, and mid-block.

The chart on this page outlines the existing crossing/pavement widths, reduced crossing/pavement widths, potential reduction of parking spaces, and whether it is aligned with existing sidewalk on one or both sides.

All of the alternatives would result in some amount of reduced parking. State law requires a gap of 20' from the edge of the crosswalk marking to the start of any marked parking spaces, though this may be reduced with a bulbout.

The northern crossing was rejected as an alternative because it is away from the predominant walking path between the Common and the proposed sidewalk on Wall Street, and there is a high likelihood that pedestrians would continue to cross at the south end of the block. Additionally, the configuration of parking along the north side of the Common would likely restrict sight lines and visibility of pedestrians in the crosswalk to drivers.

The mid-block crosswalk was dismissed as an alternative because due to safety concerns. Design preference is that crosswalks be at an intersection over mid-block, since drivers are more likely to anticipate pedestrians at intersections than at mid-block locations. This section of road is quite short, approximately 140' and design requirements for mid-block crossings are for 155' of sight distance from all vehicular approaches to both ends of the crossing. This is too close for turning cars to adequately see pedestrians.

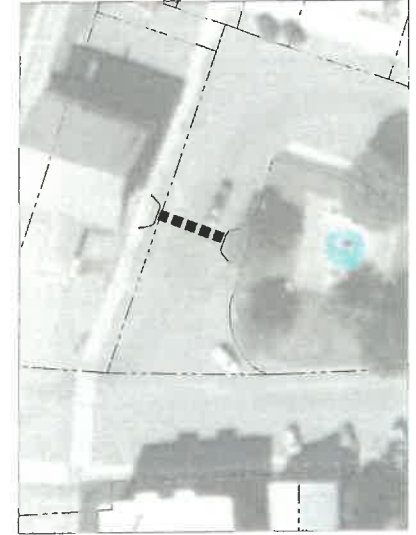
While the southern crossing is still the greatest crossing width, even while reduced, it is the safest and most direct alternative and therefore the preferred.



Southern crossing: 88' reduced to 61'  
Preferred Alternative



Northern crossing: 50' reduced to 42'

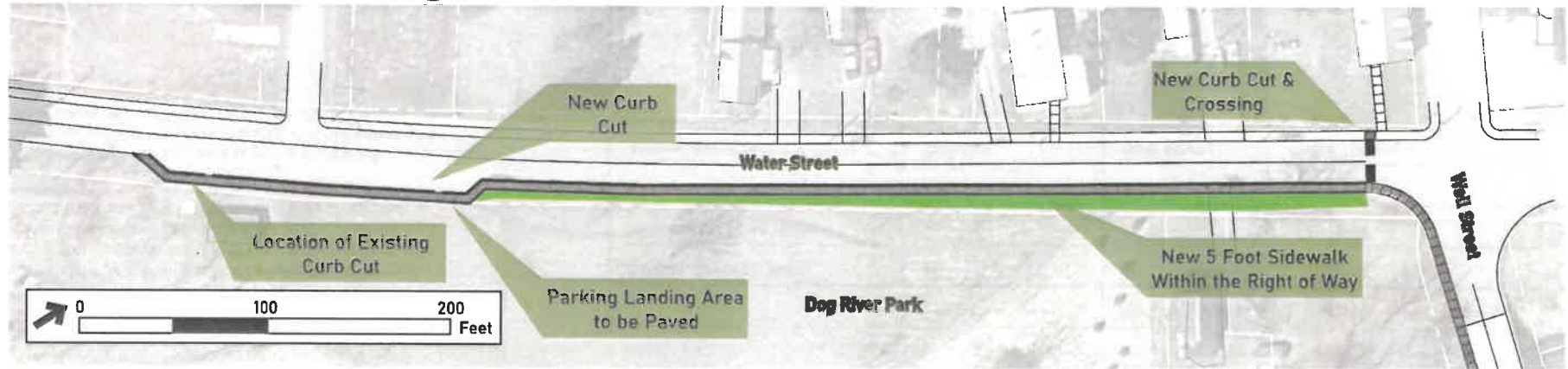


Mid-block crossing: 50' reduced to 34'

	Southern Crossing	Northern Crossing	Mid-Block Crossing
Existing Crossing Width	88'	50'	50'
Reduced Crossing Width	61'	42'	34'
Reduction of Parking Spaces	2-3	3	4+
Aligned with Existing Sidewalk?	Both sides	Both sides	One side



# Water Street Design Alternative 1



Alternative 1 remains within the street right of way. This alternative adds a curbed, five foot sidewalk along the eastern side of Water Street. This design adds a new connection between the northeast and west sides of the street with a new crosswalk and curb cut, as well as adds an additional curb cut to the park's parking area to the south.

## Design Strengths

This design presents a simple and straightforward path of travel along Water Street. By placing the sidewalk within the right-of-way, the FEMA-associated restrictions with Dog River Park can be avoided (see following page for more on FEMA restrictions.)

The addition of two new curb cuts will make movement easier for people who use mobility devices. Additionally, the new crosswalk will effectively connect Wall Street and Dog River Park to the west side of Water Street



A crosswalk from the east side of Water Street to the west side of Water Street, along with a new curb cut, would connect Wall Street to the existing sidewalk network on Water Street. Photo Credit: Google Maps

and its associated sidewalk network.

## Design Impacts

There may be concern that, given the existing sidewalk on the west side of Water Street, this new side walk on the east side may be redundant. Additionally, there is no preexisting sidewalk south of this alternative this side of Wall Street. When users of this alternative arrive at the southern most point of the proposed sidewalk, there is no more sidewalk for them to follow, nor is there a crosswalk to venture to the sidewalk network on the other side of the street.

Stormwater improvements would likely be required as a part of this design alternative; while specific improvements are not identified at the stage, they are included in the Opinion of Probable Construction Cost. There is existing storm drain and inlets located on the west side of Water Street.

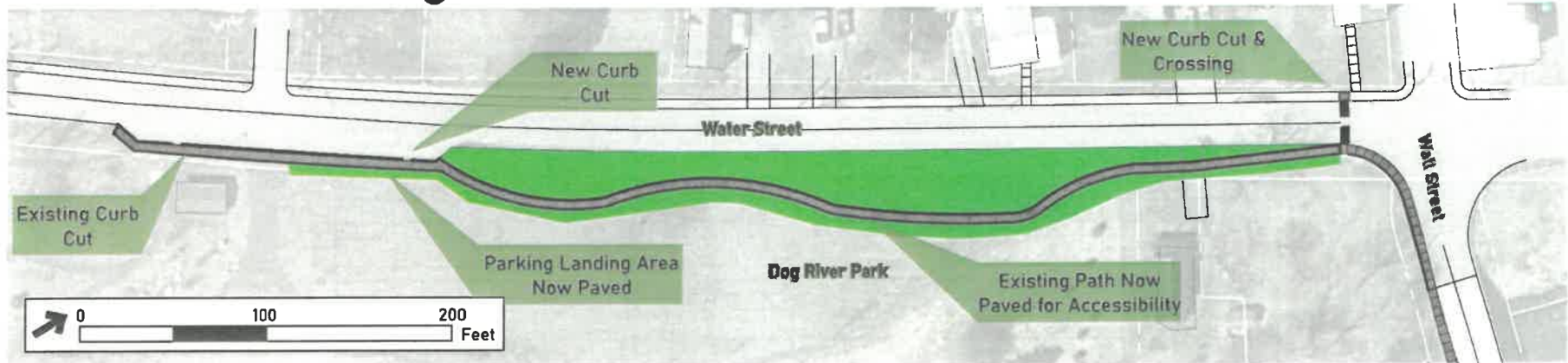


Existing sidewalk on the west side of Water Street, whose presence may make a sidewalk on the east side redundant





# Water Street Design Alternative 2



For the Water Street portion of the project area, this alternative replaces the existing gravel path through Dog River Park with a paved, 5 foot path. This alternative also connects the north east side of Water Street to the north west side of Water Street with a new crosswalk and curb cut, and adds an additional curb cut to the park parking area to the south. It is currently unclear if FEMA would permit a paved path through Dog River Park, outside of the Right-of-Way.

## Design Strengths

This alternative provides a protected path for this section of Water Street. By keeping the path far from the road, and instead meandering through Dog River Park, the path creates a more pleasant user experience. This design also improves the accessibility of the existing path through Dog River Park, which has been called out by members of the community as challenging to travel for people who use mobility devices. It also connects both sides of Water Street which were formerly unconnected via the curb cut and new crosswalk to the north, as well as adds a new curb cut to the parking area, increasing accessibility for those parked there.



There is only one curb cut next to the Dog River Park parking area, and the landing area is not paved



In this design, the gravel path in Dog River Park will be paved to be more accessible to all users

## Design Impacts

Dog River Park was created as a result of 2011 Tropical Storm Irene flooding the homes in the area that would become the park. After the substantial flood damage, the Town of Northfield with the assistance of FEMA purchased the properties. The result was Dog River Park; a functioning floodplain where floodwaters can slowly spread out and let debris settle. It is estimated that without Dog River Park, the July 2023 flooding along Water Street would have been 6 inches higher. As a vital stormwater management resource, as well as being a FEMA project, there may be significant restrictions and stormwater management repercussions to adding an impervious surface to the park.

Additionally, for those looking to travel as efficiently as possible in this area, a meandering path may not be the best choice, and users may create a "desire path" along the edge of the park, or cross the street to the sidewalk on the other side, skipping the park altogether. Therefore, while updating the existing path in Dog River Park will make the park experience a more inclusive one, it may not serve the purpose of supporting car-free travel in the project area as effectively as other designs.



July 10, 2023 by Chris Alger  
Image of the 2023 flooding, partially mitigated by Dog River Park (called out in yellow.) Photo credit: Chris Alger

# Alternatives Opinion of Construction Costs



Northfield Pedestrian Scoping Study  
Opinions of Probable Construction Cost (Conceptual)  
06.13.2024

Item	Description	Unit	Unit Cost	Wall Street		Water Street						
				alt. 1 (north on east side, south on west side)		alt. 2 (south only)		alt. 1 (east adjacent to road, full)		alt. 2 (east, along path)		
				Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	
201.10	Clearing and Grubbing	LS	varies	1	\$2,000	1	\$2,000	1	\$500	1	\$500	
203.15	Common Excavation	CY	\$20	280	\$5,600	300	\$6,000	210	\$4,200	150	\$3,000	
203.30	Earth Borrow	CY	\$20	1	\$20	1	\$20	1	\$20	1	\$20	
210.10	Coarse-Milling, Bituminous Pavement	SY	\$3	0	\$0	160	\$480	110	\$330	30	\$90	
301.28	Subbase of Crushed Gravel, Fine Graded	CY	\$25	160	\$4,000	180	\$4,500	130	\$3,250	90	\$2,250	
406.38	Hand Placed Bit. Conc. Material, Drives	SY	\$30	160	\$4,800	160	\$4,800	110	\$3,300	30	\$900	
616.28	Cast-In-Place Concrete Curb, Type B	LF	\$85	605	\$51,425	665	\$56,525	650	\$55,250	175	\$14,875	
616.41	Removal of Existing Curb	LF	\$15	155	\$2,325	190	\$2,850	161	\$2,415	175	\$2,625	
618.10	Portland Cement Concrete Sidewalk, 5"	SY	\$170	440	\$74,800	520	\$88,400	365	\$62,050	115	\$19,550	
618.11	Portland Cement Concrete Sidewalk, 8"	SY	\$175	140	\$24,500	115	\$20,125	0	\$0	0	\$0	
618.30	Detectable Warning Surface	SF	\$55	35	\$1,925	40	\$2,200	25	\$1,375	25	\$1,375	
630.10	Uniformed Traffic Officers	HR	\$70	80	\$5,600	80	\$5,600	80	\$5,600	80	\$5,600	
630.15	Flaggers	HR	\$45	500	\$22,500	500	\$22,500	225	\$10,125	225	\$10,125	
635.11	Mobilization / Demobilization	10% of pay items			1	\$30,000	1	\$31,000	1	\$18,000	1	\$11,000
641.11	Traffic Control, All-Inclusive	LS	varies	1	\$10,000	1	\$10,000	1	\$3,000	1	\$3,000	
646	4" White Line	LF	\$2	1430	\$2,860	1350	\$2,700	0	\$0	0	\$0	
646.5	12" Durable Crosswalk Markings	LF	\$22	220	\$4,840	290	\$6,380	25	\$550	25	\$550	
651.15	Seed	LB	\$14	6	\$84	6	\$84	0	\$0	23	\$322	
651.18	Fertilizer	LB	\$6	12	\$72	11	\$66	0	\$0	45	\$270	
651.20	Agricultural Limestone	TON	\$950	0.1	\$95	0.1	\$95	0	\$0	0	\$190	
651.35	Topsoil	CY	\$45	14	\$630	12	\$540	0	\$0	50	\$2,250	
653.01	EPSC Plan and Measures	LS	varies	1	\$5,000	1	\$5,000	1	\$3,000	1	\$6,000	
653.02	Monitoring EPSC Plan	HR	\$60	160	\$9,600	140	\$8,400	140	\$8,400	140	\$8,400	
653.03	Maintenance of EPSC Plan	LU	varies	1	\$2,500	1	\$2,500	1	\$1,500	1	\$5,000	
653.10	Hay Mulch	TON	\$1,400	0.1	\$140	0.1	\$140	0.0	\$0	0.2	\$280	
656.85	Tree Protection	LS	varies	1	\$1,000	1	\$1,000	1.0	\$2,000	1.0	\$2,000	
675	Signage	LS	varies	1	\$1,000	1	\$1,000	1.0	\$750	1.0	\$750	
SP	Drainage Improvements	LS	varies	1	\$5,000	1	\$5,000	1	\$10,000	1	\$10,000	
SP	Railroad gate relocation	LS	\$50,000	1	\$50,000	1	\$50,000	0	\$0	0	\$0	
SP	Aggregate surface course, trail	LS	\$68	0	\$0	0	\$0	0	\$0	60	\$4,068	
Subtotal, Opinion of Probable Construction Cost (OPCC)					\$322,316		\$339,905		\$195,615		\$114,990	
Contingency (20%)					\$64,463		\$67,981		\$39,123		\$22,998	
OPCC, Conceptual					\$386,779		\$407,886		\$234,738		\$137,988	
OPCC, Conceptual (rounded)					\$390,000		\$410,000		\$240,000		\$140,000	
\$ / LF (OPCC)					\$541		\$604		\$361		\$199	
Engineering and Admin. Costs (22%, adjusted for total cost rounding)					\$85,556		\$91,667		\$55,000		\$30,556	
Construction Admin. (14%, adjusted for total cost rounding)					\$54,444		\$58,333		\$35,000		\$19,444	
Non-Construction Related Project Costs					\$140,000		\$150,000		\$90,000		\$50,000	
<b>Total Project Costs (excluding ROW costs)</b>					<b>\$530,000</b>		<b>\$557,886</b>		<b>\$330,000</b>		<b>\$190,000</b>	
<b>Estimated Total Project Costs Range (excluding ROW costs)</b>					<b>\$525K - \$550K</b>		<b>\$550K - \$600K</b>		<b>\$300K - \$350K</b>		<b>\$175K - \$225K</b>	

**Assumptions:**

- Utility company will pay for costs associated with any required relocation of utility poles.
- Replacement of existing curbing will be needed where new curbing is proposed.

NOTE: In providing Opinions of Probable Construction Costs, the Client understands that DuBois & King, Inc. has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's methods of pricing, and that our Opinion of Probable Construction Costs are made on the basis of our professional judgment and experience. DuBois & King, Inc. makes no warranty, expressed or implied, that the bids or the negotiated costs of the Work will not vary from the Opinion of Probable Construction Cost provided herein. DuBois & King, Inc. is not providing professional estimating services, and actual pay items and material quantities also may vary from the pay items and quantities included in this Opinion of Probable Construction Costs.



# Community Alternatives Feedback

On March 26, 2024, 20 members of the Northfield Community gathered in person and online to view and share their opinions on the above alternatives. The following is a summary of the discussions that evening.

## Wall Street

An informal survey of attendees showed strong support for Wall Street Alternative 1 (a sidewalk north of Wall Street) and no support for Wall Street Alternative 2. Event participants largely expressed the Alternative 1 was the more logical path to take on Wall Street because of the numerous parking lot entrances to cross in Alternative 2. Regarding the area west of the fire station, there was support for adding a green buffer between the sidewalk and the road, as in Sub-Alternative 1B, but an acknowledgment that having the sidewalk next to the road would be acceptable as well. Participants largely did not like Sub-Alternative 1C, with the sidewalk meandering behind the ash trees. They expressed concern that most people would not use the path, and instead choose to walk straight next to the road, and that such an option would just make the sidewalk unnecessarily longer.

## Water Street

One participant voiced strong support for Water Street Alternative 2, stating that the straight sidewalk would be more efficient for travel, and thus be preferred by many. Participants did note that an accessible path through Dog River Park would be desirable in its own right, but questioned the need to add impervious surfaces to the park.



The Town of Northfield is exploring options to create a continuous sidewalk or pedestrian path primarily along Wall Street, connecting Depot Square to Dog River Park, crossing Dog River and the railroad tracks.

After robust community discussion and site reviews, the project team is presenting alternative design solutions. At this Alternatives Presentation the project team will show different potential designs for a pedestrian path in this area. If you'd like an opportunity to discuss this project, ask questions about the design alternatives, or voice concerns, please join us in person or online



# Alternatives Comparison Matrix

An Alternatives Evaluation Matrix was developed that weighed multiple elements of each goal. The average of these scores is indicated in green columns as Safety Average, Effort & Impact Average, and Support Average. The final score for each alternative is a sum of these three averages.

Scores are 0 through 3:

- In the Project Goals columns, a higher score (up to 3) means greater pedestrian safety or traffic calming.
- In the Impacts and Cost columns, a higher score means lower impacts or lower costs.
- In the Community Support column, a higher score means greater support in the Alternatives Survey.

The top two ranking alternatives in this methodology are Wall Street Alternative 1 and Water Street Alternative 1.

Alternative	Project Goals				Impacts & Cost								Community Support		FINAL SCORE	
	Improved Pedestrian Safety	Connects Homes with Community Resources	Traffic Calming	AVERAGE GOALS SCORE	Property Impacts		Utility Impacts		Archaeological Impacts		Cost		AVERAGE IMPACT & COST SCORE	Positive Responses from Community		AVERAGE SUPPORT SCORE
Concept 0: No-Build	0	0	0	0	None	3	None	3	None	3	\$0	3	3	0	0	3
Wall Street Alternative 1: North Side Sidewalk	3	3	2	2.7	Potential Impacts to 2 Properties	2	Relocation of fire hydrant and potential impacts to 2 inlets	2	None	3	\$525k-\$550k	2	2.3	3	3	8
Wall Street Alternative 2: South Side Sidewalk	3	3	1	2.1	Potential Impacts to 3 Properties	2	Relocation of 5 poles and potential impacts to 4 inlets	1	None	3	\$550k-\$600k	1	1.8	1	1	4.9
Water Street Alternative 1: Road Adjacent Sidewalk	3	3	0	2	None	3	Potential for additional inlet	2.5	Potential Impacts if excavation is greater than 1-2' in depth.	2.5	\$300k-\$350k	1	2.3	3	3	7.3
Water Street Alternative 2: Paved Park Path	3	2	0	1.7	Impacts to Dog River Park	2	Potential for additional inlet	2.5	Potential Impacts if excavation is greater than 1-2' in depth.	2.5	\$175k-\$225k	2	1.3	2	2	5



# Post-Public Feedback Alternatives Evaluation

## Bus Stop?

As part of this design process, the option to restore the GMT bus stop in Depot Square to its original location was explored.

After a desktop analysis of the design alternatives, it was determined that there is not enough room for both a bus stop and an accessible pathway to fit without encroaching onto the private property of 70 Depot Square. Instead, it is the recommendation of this document that a bus stop around Depot Square be explored in the 2024 Northfield Town Common Revitalization Project; which also focuses on Depot Square and is also being led by Dubois & King.

## Considering Dog River Park

When considering which configuration to adopt for Water Street, it quickly became apparent that any construction done in Dog River Park would be complicated. Dog River park was created as a result of 2011 tropical storm Irene flooding the homes in the area that would become the park. After the substantial flood damage, the Town of Northfield with the assistance of FEMA purchased the properties. The result was Dog River Park; a functioning floodplain where floodwaters can slowly spread out and let debris settle. It is estimated that without Dog River Park, the July 2023 flooding along Water Street would have been 6 inches higher. As an important stormwater management resource, as well as being a FEMA project, there are significant restrictions and stormwater management repercussions to adding an impervious surface to the park. In current FEMA Open Space Guidance, paved surfaces are not allowed, and it is unclear if FEMA would reconsider allowing any paved surface, even if it would improve accessibility. For this reason, adjusting the path in Dog River Park was considered an unlikely alternative.

Additionally, public feedback noted that for individuals using Water Street to travel, and not to visit the park, a meandering path through the park was less desirable than a straightforward, and shorter, path along the road. For this reason, it was determined that adding a paved path in Dog River Park would not substantially improve the goal of enhancing multi-modal transportation in the project area as much as connecting the proposed sidewalk into the existing sidewalk network. This document recognizes that

a universally accessible path in Dog River Park is a worthy goal and would be a public good, currently not met by the existing conditions observed during this project. Further study of accessibility improvements in Dog River Park is recommended to empower all members of the community to enjoy this beautiful community resource.

## Existing Sidewalks

Additionally, on the other side of Water Street is an existing sidewalk, which connects to a greater network in the surrounding neighborhoods. Both Water Street design alternatives add access to this sidewalk via a new street crossing. Because of this sidewalk, pedestrians have an option for traveling in this area. Adding an additional sidewalk on the other side in the road, as shown in Water Street Design Alternative 2, could be redundant. However, such a sidewalk may still be of value, particularly to those parking at Dog River Park, therefore, this alternative may be appropriate as a second phase of construction, something explored more in the Water Street Preferred Alternative.

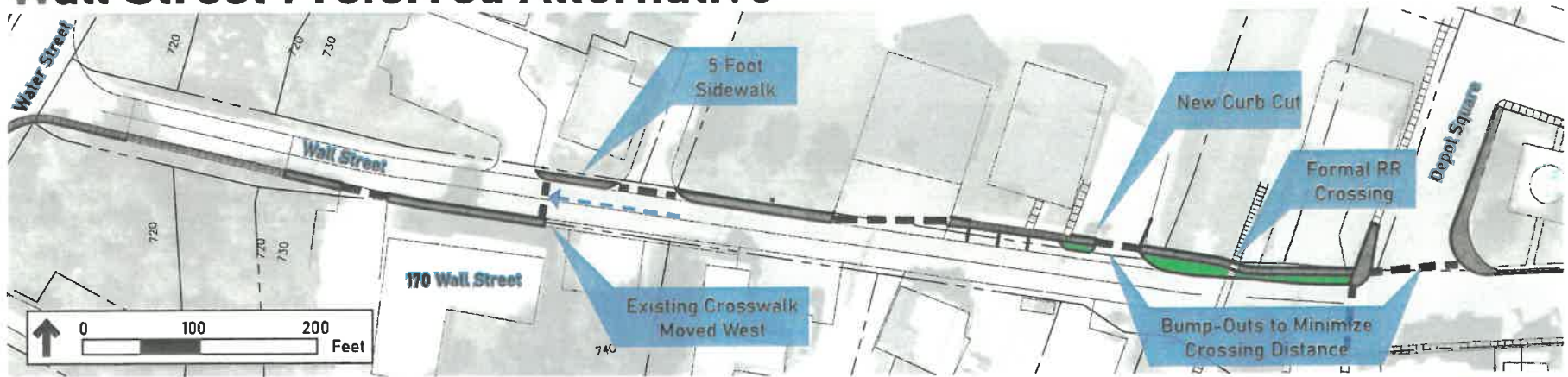


# Preferred Design Alternatives





# Wall Street Preferred Alternative



This design is similar to Wall Street Alternative 1, but has only one option for the area west of the fire station, discussed below.

In this design, a 5 foot paved path has been added along the north side of Wall Street. The path is partly directly on the road, separated by curbing, and partly set back from the road, separated by curbing and a planting strip. For the section immediately west of the fire station, the sidewalk is adjacent to the road, separated by curbing.

On Depot Square, the existing crossing of 88 feet has been reduced to 61 feet through the addition of two bump-outs. These two bump-outs both narrow the crossing distance, and create a pedestrian refuge that puts pedestrians in better view of turning vehicles, while also separating them from the road through curbing.

The existing crosswalk by the Northfield Senior Center has been moved further west. Moving this crosswalk places it closer to the entrance of the Senior Center, and also avoids funneling pedestrians to cross the parking lot east of 170 Wall Street.

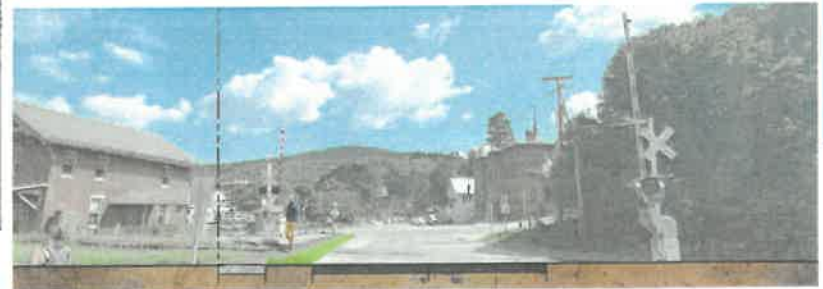
This design proposes a formalized railroad crossing, illustrated in section to the right. Under existing conditions, pedestrians cross the railroad wherever suits them best, as there is no formalized crossing location.



The existing railroad "crossing". In this design, this crossing is formalized, and separated from the



Image above: the existing railroad, without an official pedestrian crossing. Image below: section of the proposed solution.



# Wall Street Preferred Alternative (continued)

## Design Strengths

By adding a sidewalk separated from the road, this design gives pedestrians a protected refuge from vehicles on Wall Street and Depot Square.

Additionally, by moving the Wall Street crosswalk further west, this design helps pedestrians avoid crossing the parking lot for 170 Wall Street. The existing crosswalk is orientated in such a way that pedestrians must cross the 170 Wall Street parking lot. All together, there are seven parking lot entrances on Wall Street, and this design avoids all but two. Of those two, the fire station crossing is unaltered from existing conditions (for emergency vehicle access) but the other crossing, at the police station, has been shorted from 57 feet to 30 feet with the addition of a bump-out.

Likewise, the street crossing at Depot Square has also been shortened from 88 feet to 61 feet with the addition of two bump-outs. Shortening these crossing distances has two benefits: firstly, the shorter crossing distances minimizes the time users are in the path of traffic. Secondly, by shortening this crossing, pedestrians are more centered in a vehicle driver's "cone of vision". This cone represents the width of vision drivers have while in their vehicles. The further to the periphery people or objects are, the less likely a driver is to be able to see them.

## Design Impacts

According to the Historical Resource Inventory (HRI) performed by Polly Seddon Allen, there are two historic properties in the Wall Street/ Depot Square section of the project area, The Vermont National Guard Armory at 61 Wall Street and The Vermont Central Railway Depot at 70 Depot Square. However, this design affects neither property.

Narrowing the Depot Square crossing and the entrance to the Police Station parking lot

will impact vehicles traveling through those areas. As part of the design process, a desktop analysis of the narrowed crossings' geometry confirmed that this would not impede vehicle movement, including the large trucks that often stop in Depot Square to make deliveries.

A sidewalk connecting to the eastern bump out on Depot square has also been added to the Town Common, connecting to the existing sidewalk.



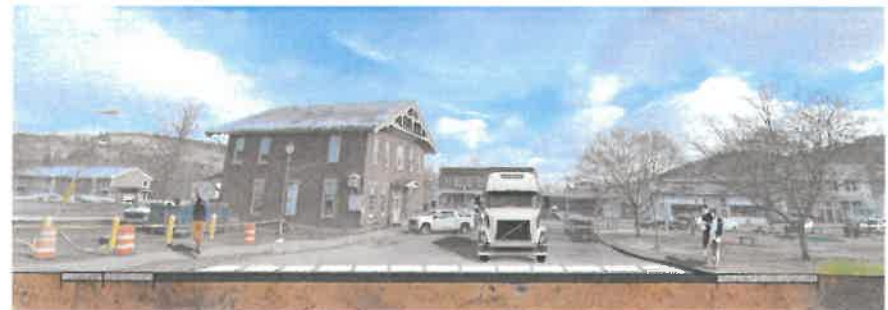
Desktop review of truck turning radii in Depot Square



Graphic representing a driver's view of the road, which varies with speed (Source: Complete Streets; A Guide for Vermont Communities p. 15)



Image above: the existing crossing at Depot Square. Image below: the designed alternative.





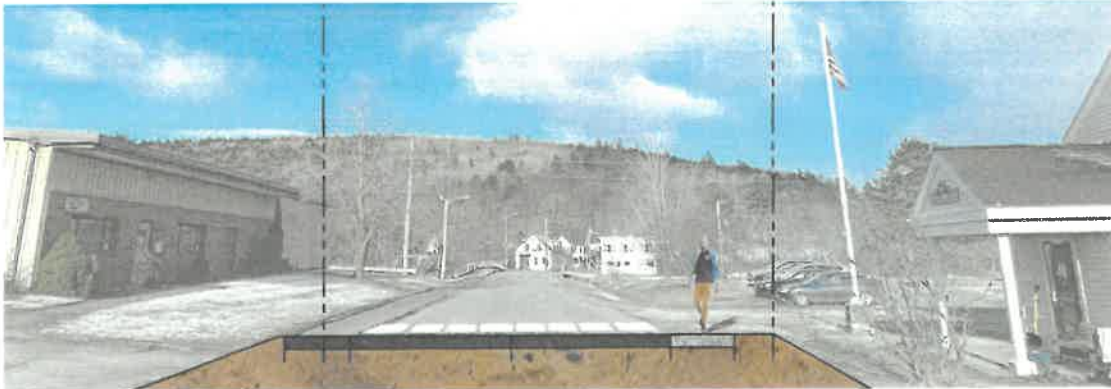
# Wall Street Preferred Alternative (continued)



*A road section of Wall Street under existing conditions*



*The existing street crossing, which has users cross the parking lot at 173 Wall Street, a 52 foot distance*



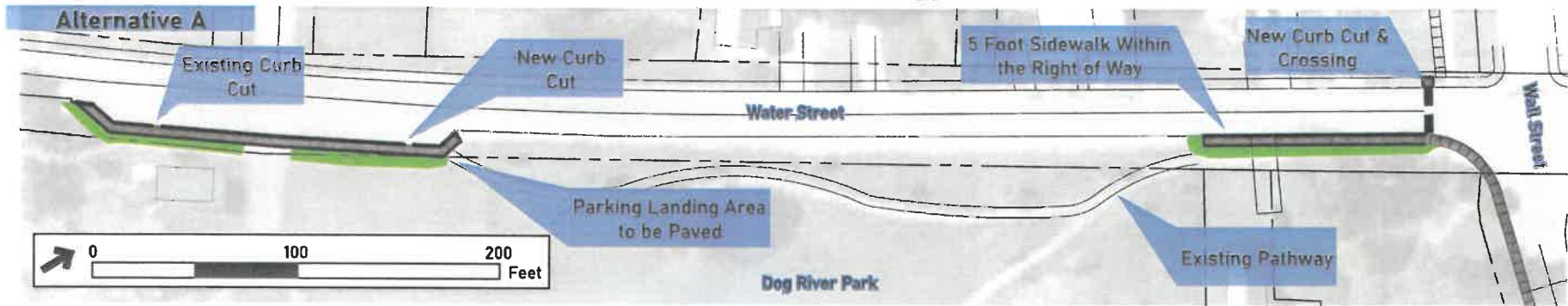
*Wall Street with the proposed new crosswalk and sidewalk*



*The new crosswalk location (noted by the traffic cone). By crossing in this location, pedestrians avoid the 52 foot driveway crossing at 173 Wall Street*



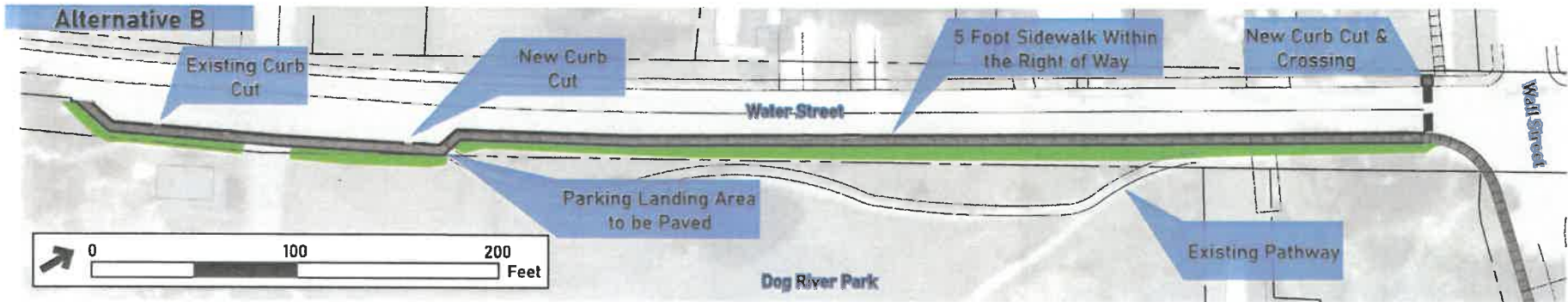
# Water Street Preferred Alternatives A & B



This design adds a new crossing and curb cut the intersection of Water and Wall Street, connecting Wall Street to the existing sidewalk network on the west side of Water Street. This design also adds a formal, 5 foot sidewalk between the intersection and the entrance to Dog River Park, creating an official path where there currently is none.

Stormwater improvements would likely be required as a part of this design alternative; while specific improvements are not identified at the stage, they are included in the Opinion of Probable Construction Cost. There is existing storm drain and inlets located on the west side of Water Street.

This design also adds a paved and curbed area adjacent to the parking at Dog River Park, and adds an extra curb cut for easier access to the park.



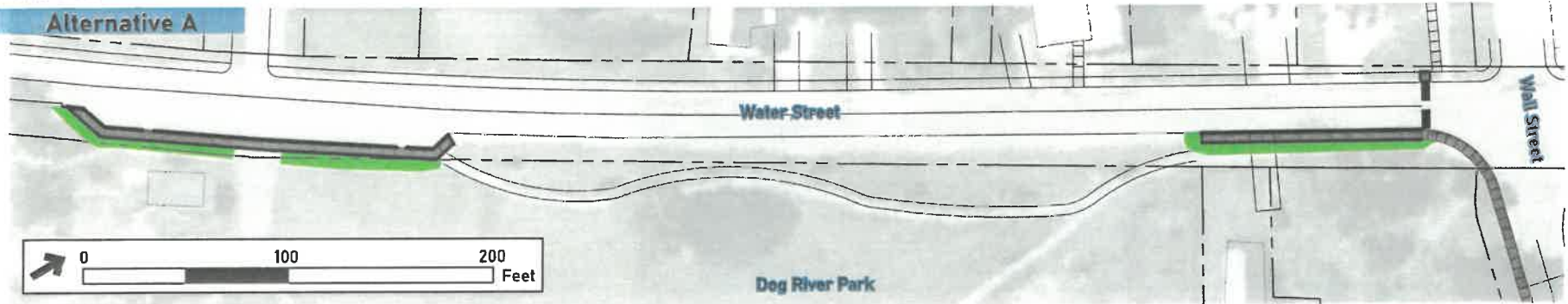
Design B is the same as Design A, with the addition of a curbed, five foot sidewalk within the right of way. This addition could be part of the original installation, could be a later addition, or could be skipped over altogether. These options are explored more in the "Design Strengths & Impacts" sections.

Stormwater improvements would likely be required as a part of this design alternative; while specific improvements are not identified at the stage, they are included in the Opinion of Probable Construction Cost. There is existing storm drain and inlets located on the west side of Water Street.





# Water Street Preferred Alternative A



## Design Strengths

This design connects Wall Street to the existing sidewalk on Water Street, and thus the sidewalk network beyond. It also gives pedestrians a sense of arrival to Dog River Park, by creating a formal path to the north side of the park, rather than the informal path that is there now, which may be hard to differentiate from the private home it crosses in front of.

This design also makes access to the southern end of the park easier for some users. By adding a curbed and paved landing area next to the parking, some park users may have an easier time entering the park from this location, particularly those on wheels or pushing strollers.

By only adding paving in selected areas where there currently are none, this alternative also keeps costs lower, and avoids redundancy by not adding a sidewalk to a street where there is already a sidewalk on the other side of the road. By leaving the area in front of Dog River Park open, this design also conserves the existing form and function of the park, both as a public facility and also as a

stormwater management area. By leaving the park as it currently is, room has been left for the Town of Northfield and FEMA to explore a project to specifically address the path accessibility issues within the park (discussed further in 'Design Impacts'). As this project specifically addresses transportation between Dog River Park and Depot Square, it was determined park accessibility is outside of the scope of this project, and instead could be better addressed in a separate, more directed project. However, this document acknowledges that making Dog River Park more accessible could increase usership of the sidewalks proposed in this project, making park accessibility a directly related issue, as well as a public good in general.

## Design Impacts

Through this design and the design for Wall Street, many people will be able to enjoy a formal path from Depot Square to Dog River Park and beyond. However, some users may be excluded from this. Specifically, users who park at Dog River Park and wish to walk or wheel to Depot Square must use the existing path through Dog River Park. As discussed earlier, this

path has been noted by the community as being difficult to use by people who use mobility devices. While this design does create an accessible path from Water Street generally to Depot Square, it is the specific link from the Dog River Park parking area to the paved walkway proposed by this design that is the issue.

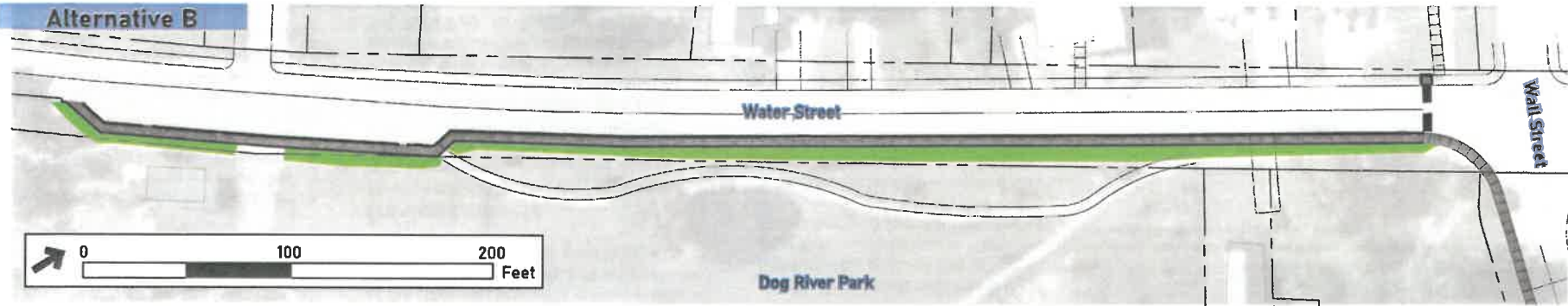
To address this issue three options are suggested:

1. Add a mid-block crossing at the parking area, connecting it to the sidewalk across the street.
2. Add a formal sidewalk within the right-of-way, or phase one in at a later date, as illustrated in Water Street Design B (see following page.)
3. Explore replacing the existing path with an accessible one in a separate project.



The current intersection of Wall and Water Streets lacks a defined crossing and a curb cut on Wall Street's west side. This design adds both.

# Water Street Preferred Alternative B



## Design Strengths

This design presents a simple and straightforward path of travel along Water Street for pedestrians. By placing the sidewalk within the right-of-way, the FEMA-associated restrictions with Dog River Park can be avoided.

The addition of two new curb cuts will make movement easier for people who use mobility devices, or older adults. Additionally, the new crosswalk will effectively connect Wall Street and Dog River Park to the west side of Water Street and its associated sidewalk network.

## Design Impacts

There may be concern that, given the existing sidewalk on the west side of Water Street, this new side walk on the east side may be redundant. Additionally, there is no preexisting sidewalk south of this alternative. When users of this alternative arrive at the southern most point of the proposed sidewalk, there is no more sidewalk for them to follow, nor is there a crosswalk to venture to the sidewalk network on the other side of the street.



*The parking area at Dog River Park is unpaved, making it difficult to navigate for some users, and has only one curb cut. This design paves the parking landing area for increased accessibility, and adds a second curb cut on the north end of the parking area.*



*The existing sidewalk on Water Street's west side may make an additional sidewalk on the eastern side redundant*





# Preferred Alternative Opinion of Probable Construction Cost



Northfield Pedestrian Scoping Study  
Opinions of Probable Construction Cost (Conceptual)  
06.13.2024

Item	Description	Unit	Unit Cost	Wall Street (north on east side, south on west side)		Water Street alt. A (east adjacent to road, partial)		alt. B (east adjacent to road, full)	
				Qty	Cost	Qty	Cost	Qty	Cost
201.10	Clearing and Grubbing	LS	varies	1	\$2,000	1	\$500	1	\$500
203.15	Common Excavation	CY	\$20	280	\$5,600	90	\$1,800	210	\$4,200
203.30	Earth Borrow	CY	\$20	1	\$20	1	\$20	1	\$20
210.10	Coarse-Milling, Bituminous Pavement	SY	\$3	0	\$0	50	\$150	110	\$330
301.28	Subbase of Crushed Gravel, Fine Graded	CY	\$25	150	\$4,000	60	\$1,500	130	\$3,250
406.38	Hand Placed Bit. Conc. Material, Drives	SY	\$30	160	\$4,800	50	\$1,500	110	\$3,300
616.28	Cast-in-Place Concrete Curb, Type B	LF	\$85	605	\$51,425	270	\$22,950	650	\$55,250
616.41	Removal of Existing Curb	LF	\$15	155	\$2,325	171	\$2,565	161	\$2,415
618.10	Portland Cement Concrete Sidewalk, 5"	SY	\$170	440	\$74,800	155	\$26,350	365	\$62,050
618.11	Portland Cement Concrete Sidewalk, 8"	SY	\$175	140	\$24,500	0	\$0	0	\$0
618.30	Detectable Warning Surface	SF	\$55	35	\$1,925	25	\$1,375	25	\$1,375
630.10	Uniformed Traffic Officers	HR	\$70	80	\$5,600	40	\$2,800	80	\$5,600
630.15	Flaggers	HR	\$45	500	\$22,500	100	\$4,500	225	\$10,125
635.11	Mobilization / Demobilization	10% of pay items		1	\$30,000	1	\$9,000	1	\$18,000
641.11	Traffic Control, All-Inclusive	LS	varies	1	\$10,000	1	\$2,000	1	\$3,000
646	4" White Line	LF	\$2	1430	\$2,860	0	\$0	0	\$0
646.5	12" Durable Crosswalk Markings	LF	\$22	220	\$4,840	25	\$550	25	\$550
651.15	Seed	LB	\$14	6	\$84	0	\$0	0	\$0
651.18	Fertilizer	LB	\$6	12	\$72	0	\$0	0	\$0
651.20	Agricultural Limestone	TON	\$950	0.1	\$95	0	\$0	0	\$0
651.35	Topsoil	CY	\$45	14	\$630	0	\$0	0	\$0
653.01	EPSC Plan and Measures	LS	varies	1	\$5,000	1	\$2,000	1	\$3,000
653.02	Monitoring EPSC Plan	HR	\$60	160	\$9,600	60	\$3,600	140	\$8,400
653.03	Maintenance of EPSC Plan	LU	varies	1	\$2,500	1	\$1,000	1	\$1,500
653.10	Hay Mulch	TON	\$1,400	0.1	\$140	0.0	\$0	0.0	\$0
656.85	Tree Protection	LS	varies	1	\$1,000	1.0	\$250	1.0	\$2,000
675	Signage	LS	varies	1	\$1,000	1.0	\$500	1.0	\$750
SP	Drainage improvements	LS	varies	1	\$5,000	1	\$5,000	1	\$10,000
SP	Railroad gate adjustments	LS	\$50,000	1	\$50,000	0	\$0	0	\$0
SP	Aggregate surface course, trail	LS	\$68	0	\$0	0	\$0	0	\$0
Subtotal, Opinion of Probable Construction Cost (OPCC)					\$322,316	\$89,910	\$195,615		
Contingency (20%)					\$64,463	\$17,982	\$39,123		
OPCC, Conceptual					\$386,779	\$107,892	\$234,738		
OPCC, Conceptual (rounded)					\$390,000	\$110,000	\$240,000		
\$/ LF (OPCC)					\$541	\$394	\$361		
Engineering and Admin. Costs (22%, adjusted for total cost rounding)					\$85,556	\$24,444	\$55,000		
Construction Admin. (14%, adjusted for total cost rounding)					\$54,444	\$15,556	\$35,000		
Non-Construction Related Project Costs					\$140,000	\$40,000	\$90,000		
Total Project Costs (excluding ROW costs)					\$530,000	\$150,000	\$330,000		
Estimated Total Project Costs Range (excluding ROW costs)					\$525K - \$550K	\$125K - 175K	\$300K - \$350K		

**Assumptions:**

- Utility company will pay for costs associated with any required relocation of utility poles.
- Replacement of existing curbing will be needed where new curbing is proposed.

NOTE: In providing Opinions of Probable Construction Costs, the Client understands that DuBois & King, Inc. has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's methods of pricing, and that our Opinion of Probable Construction Costs are made on the basis of our professional judgment and experience. DuBois & King, Inc. makes no warranty, expressed or implied, that the bids or the negotiated costs of the Work will not vary from the Opinion of Probable Construction Cost provided herein. DuBois & King, Inc. is not providing professional estimating services, and actual pay items and material quantities also may vary from the pay items and quantities included in this Opinion of Probable Construction Costs.



# Implementation





# Beyond the Scoping Study

This scoping study is intended to act as a springboard to support the Northfield in designing, permitting, and funding the safety and connectivity features discussed in the previous chapter. The Preferred Design Concept represents the result of a focused effort to identify a clear, viable and successful path forward.

This chapter outlines steps needed to take the plans, cost estimates, diagrams and illustrations contained in this report towards an investment in the safety and comfort of users in the Village.

- Step 1 - Find a Champion
- Step 2 - Select Board Approval
- Step 3 - VTrans Coordination
- Step 4 - Landowner Engagement
- Step 5 - Fundraising & Grant Writing
- Step 6 - Survey, Design & Permitting
- Step 7 - Construction

## Step 1 - Find a Champion

Town staff or engaged resident, every plan needs a champion. Human resources are needed to use this plan as a tool to communicate public sentiment, cost, and design intent of a future sidewalk and crossing project

along Water and Wall Streets.

It was evident during the course of this planning work that Northfield has many engaged and committed residents who support the vitality and safety of the Town. There may be additional community members who can support the "doing" that happens after the "planning," by staying informed and talking with neighbors and other landowners along and near the route.

Northfield can also look to the Central Vermont Regional Planning Commission (CVRPC) for further planning guidance such as with permitting and funding, and expertise regarding next steps. The CVRPC would also be aware of potential synergies with any future roadway projects that state agencies may be planning. Coordinating sidewalk installation with subsurface utility work, for example, is a good way to achieve cost efficiencies while minimizing the duration of construction disruptions.

## Step 2 - Select Board Approval

Before a sidewalk improvement is constructed, such a change to a public roadway must be approved by the Northfield Select Board. This includes the physical change as well as the cost to the Town of providing potential matching funds for such a project. For projects of this scale, it is anticipated

that the matching cost to Northfield could be approximately 20% of total project costs.

## Step 3 - VTrans Coordination

At, or just after, scoping is an excellent time to begin using the Transportation Management Plan (TMP) checklist to determine if any additional traffic control measures or work zone easements will be required, based in part on whether the project and potential effects would be "significant," as appears to be the case based on preliminary consideration.

A TMP is the compilation of all necessary documentation related to the management of traffic within a work zone. This may include Traffic Control Plans, a Transportation Operations Plan, and a Public Information Plan as needed. Some projects require all of these components to be considered. The implementation of the Work Zone Safety and Mobility Policy and Guidance is required all federal-aid highway projects and is expected for all other construction and maintenance activities on Vermont highways.

Additional VTrans coordination will also be required, including for Right-of-Way, stormwater, design, construction, and permitting.



# Beyond the Scoping Study (continued)

## Step 4 - Landowner Engagement

Should this project, or components of this project, move forward with the support of the Selectboard, it will be important to circulate this study among affected landowners, particularly those who own property abutting the project right-of-way, and answer questions about the design intent, potential impacts, estimated timelines to construction, and right-of-way boundaries. These crucial conversations can reveal any modifications that are best understood well before the construction process.

## Step 5 - Fundraising & Grant Writing

Funding the design and construction of a new community sidewalk is likely to center around public investment in the form of matching funds to grants. The Grant Resources Table to the right outlines some of the common funding resources for Vermont towns that are seeking to develop pedestrian facilities.

Projects of this nature and cost are sometimes funded through federal resources. Federal requirements shall therefore be followed throughout the project development and implementation process.

## Step 6 - Survey, Design & Permitting

With Selectboard approval in place, local landowners consulted, and grant awards in hand, Northfield can

then move towards contracting an engineering firm to conduct a survey, and develop construction documents. See the table on the next page for an overview of permits potentially needed for this project.

## Step 7 - Construction

During construction, the Town should communicate clearly to residents, the mail and trash services, etc., when service along Water and Wall Streets may be challenging or delayed. Local emergency services personnel should be notified of the work as well.

Review VTrans Work Zone Safety and mobility checklist for additional importance items to consider before and during construction.



Grant Resources					
Grant Title	What does it fund?	Maximum Grant Amount	Local Match Required	Federal Funding	Grant Contact
<u>CDBG - Planning Grants</u>	Feasibility studies, marketing plans, engineering and architectural plans, etc.	\$60,000	10 percent	x	Julia Connell julia.connell@vermont.gov 802-828-5215
<u>VTrans - Transportation Alternatives Program (TAP)</u>	Construction, planning and design of on and off roadway facilities for active transportation facilities	\$600,000	20 percent	x	Scott Robertson scott.robertson@vermont.gov 802-793-2395
<u>VTrans - Bicycle and Pedestrian Program Grants</u>	Construction, planning and design of on and off roadway facilities for active transportation facilities	No Cap	20 percent	x	Peter Pochop peter.pochop@vermont.gov 802-477-3123
<u>VTrans - Bicycle and Pedestrian Program Grants - Small Scale</u>	Distinguished from Bike/Ped program by smaller maximum funding amount and lack of federal requirements	\$75,000	50 percent		Peter Pochop peter.pochop@vermont.gov 802-477-3123





# Permit Overview

## Permit Overview

The permits reviewed for the Preferred Design Concept, and their threshold requirements are as follows:

**State Highway Access (1111).** This permit is required when a project is within the state highway right-of-way.

**ACT 250.** There are several jurisdiction categories that trigger the need for an Act 250 permit. They are listed by the State of Vermont Natural Resources Board.

**National Environmental Policy Act (NEPA).** The NEPA process needs to be followed whenever Federal funding is involved. Based on the project type, this project likely qualifies for a categorical exclusion.

**Construction Stormwater Permit.** This permit is triggered when a project exceeds one (1) acre in disturbance.

**Stormwater Operational (Post Construction).** As of July 2022, the threshold for this permit is a half (0.5) acres of newly constructed impervious material.

**Stream Alteration.** The Stream Alteration Rule regulates activities that take place in or along streams. A permit is required for movement, excavation, or fills involving 10 or more cubic yards annually in any perennial stream.

**The United States Army Corps of Engineers (USACOE).** USACOE regulates all wetlands and fill below the Ordinary High Water (OHW).

**VT Wetland Permit.** The Vermont Wetlands Office regulates only Class I and Class II wetlands, and their 50 foot buffer.

**Local Flood Hazard Regulations.** The Town of Northfield requires a Conditional Use Review and approval by the Development Review Board as well as a permit from the Zoning Administrator for conditional uses with the Special Flood Hazard Area, Floodway, or FEH Zone. Roadway improvements are considered a conditional use.

**Flood Hazard Area & River Corridor Rule.** The Vermont Flood Hazard Area & River Corridor Rule (FHARC) regulates activities exempt from municipal regulation in flood hazard areas and river corridors.

Potential Permit Requirements		
Permit	Needed?	Explanation
State Highway Access (1111)	No	This project is entirely within Town ROW and does not intersect or abut any State Highway.
ACT 250	Maybe	This project runs adjacent to one property (Green Mountain Apartments) with an existing Act 250 permit, therefore Act 250 amendments may be required.
NEPA	Yes (Cat Ex)	Based on a review of the project type, this project likely qualifies for a Categorical Exclusion.
Construction Stormwater Permit	No	If the maximum amount of new pedestrian infrastructure proposed were installed, it would total .19 acres, well below the minimum earth disturbance area of one acre to trigger the permit.
Stormwater Operational (Post Construction)	No	The sidewalk would add about 0.2 acres of new impervious surface, well below the 0.5 acre threshold.
Stream Alteration	No	This project does not impact any streams.
USACOE General	No	This project will not disturb any lands below the ordinary high water line.
VT Wetland Permit	No	This project will not impact any wetlands.
FHARC	Maybe	The FHARC rule regulates activities exempt from municipal regulation in flood hazard areas. Since this project required local review, it may not need a FHARC permit.
Local Permit	Yes	A Conditional Use Review and approval by the Development Review Board is required in advance of a permit from the Zoning Administrator for improvements to existing roads.

