

MRG

Extension



The Mascoma River Greenway Extension Plan

a visioning study conducted
through the Thayer School of
Engineering

prepared for:

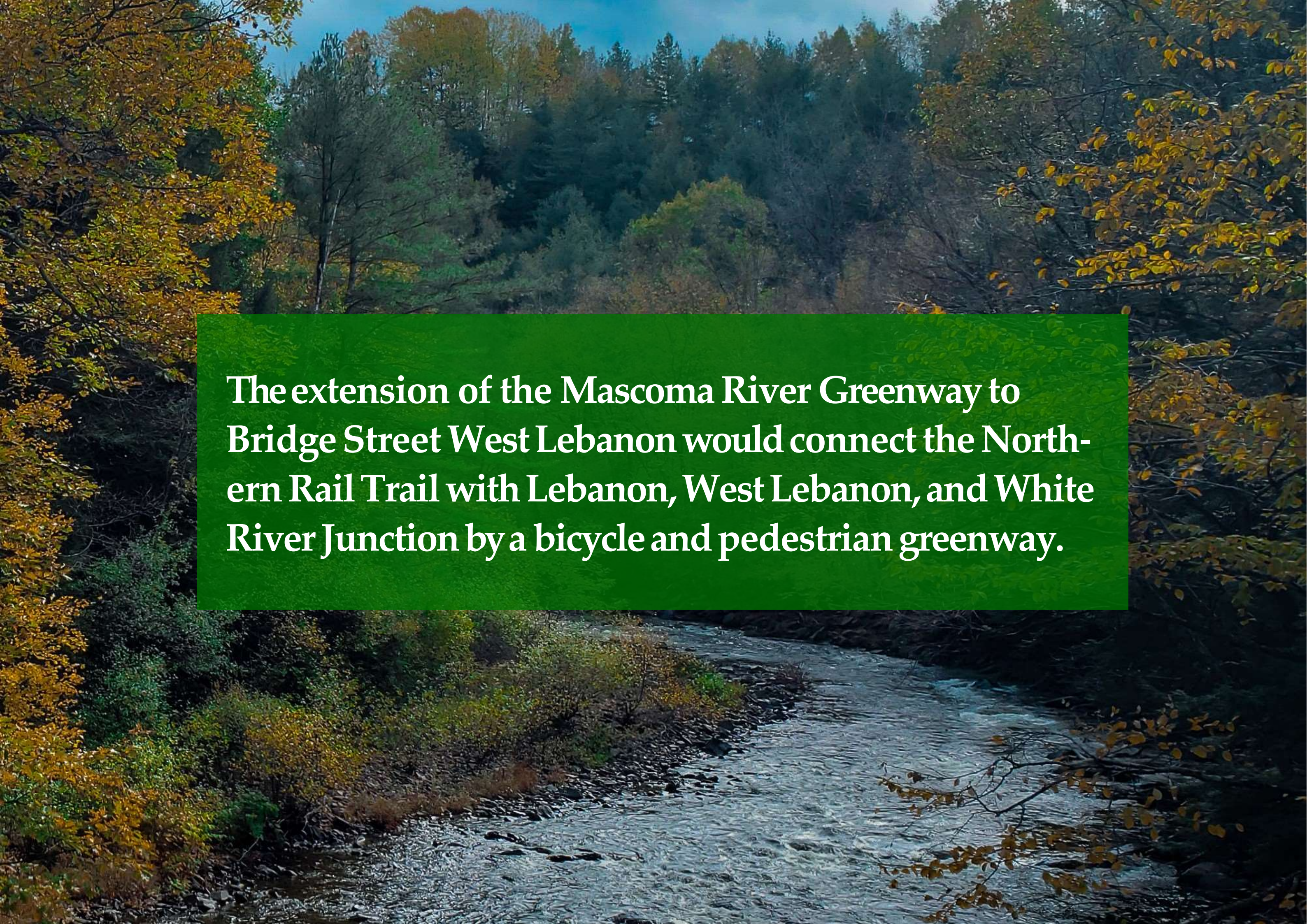
The Friends of the Northern Rail Trail

with the help of:



**and many
more.**





The extension of the Mascoma River Greenway to Bridge Street West Lebanon would connect the Northern Rail Trail with Lebanon, West Lebanon, and White River Junction by a bicycle and pedestrian greenway.

Contents

Preface	vi
Part One: Introduction & Overview	
Chapter 1: Background	4
Chapter 2: Purpose of this Extension Plan	7
Chapter 3: Exploring the Benefits of Rail Trails	8
Part Two: Project Area	
Chapter 4: The Planning Process	12
Chapter 5: Trail Design Considerations	14
Part Three: Proposed Trail Alignments	
Chapter 6: Conceptual Plans	23
Chapter 7: Rail With Trail	24
Chapter 8: South Main Street (Route 12A)	34
Chapter 9: Iron Horse Development	38
Part Four: Plan of Implementation	
Chapter 10: Cost Summary	42
Chapter 11: Funding	44
Chapter 12: Action Plan	47

Figures

Figure No. 1: Picture of the Connecticut River	vi
Figure No. 2: A Map of the Current MRG	2
Figure No. 3: Picture of the Current MRG	4
Figure No. 4: Picture of Rails Near Riverside Park	5
Figure No. 5: Thayer School of Engineering Logo	6
Figure No. 6: Conducting Fieldwork Near Riverside Park	7
Figure No. 7: Cross Country Skiing on Gunflint Ski Trail	8
Figure No. 8: Team members scouting trail end point	12
Figure No. 10: Picture of Rails Approaching Westboro Yard	14
Figure No. 11: NHDOT R-w-T Guidelines	17
Table No. 1: Signage Requirements & Guidelines	18
Figure No. 12: Various Example Signage	19
Figure No. 13: Examples of Current Signage on the MRG	20
Figure No. 14: Examples of Proposed Signage	21
Figure No. 15: Riverside Park Terminus	24
Figure No. 16: Picture of a Stone Arch Bridge by Riverside Park	25
Figure No. 17: Map of Rail-with-Trail Alignment	25
Figure No. 18: Two Views of Ramp Design	26
Figure No. 19: Maple St. to End Terminus	27
Figure No. 20: Hiwassee Bridge, New River Trail State Park, VA	29
Figure No. 21: Safety Layout for Rail-with-Trail Alignment	31
Figure No. 22: Map of Riverside Park to Powerhouse Mall	34
Figure No. 23: Map of South Main St. Alignment	35
Figure No. 24: Safety Layout for South Main St. Alignment	37
Figure No. 25: Map of Iron Horse Alignment	39
Figure No. 26: Users on the Mountain Division Trail	40
Figure No. 27: Local Volunteers Aiding with Maintenance of the MRG	46
Figure No. 28: View of the Connecticut River from End Terminus	48

Preface

The Mascoma River Greenway (MRG) is a two-mile bicycle and pedestrian trail along the old Boston & Maine rail corridor in Lebanon, NH. Beginning near the terminus of the Northern Rail Trail (NRT) at Spencer Street in downtown Lebanon, the Greenway runs along the old rail corridor westward to its current terminus at Glen Road near Riverside Park. The original vision for the Greenway continued the trail along the railroad up to Westboro Rail Yard in West Lebanon, connecting the downtown areas with a travel alternative for cyclists and pedestrians. However, plans to finish the trail were never realized. This document presents plans for the extension of the Greenway to its final terminus at the Connecticut River riverfront near the Bridge Street bridge in West Lebanon, connecting the downtowns of Lebanon, West Lebanon, and White River Junction with a scenic, multi-use path.

This document updates the Mascoma River Greenway Action Plan (2010), the original visioning study for the Greenway that became the impetus for local stakeholders and the City of Lebanon to begin planning and, eventually, construction of the trail. This updated plan will re-introduce the Greenway and the concept of “rail trails”, and discuss the myriad of benefits the trail will have on local communities. Plans for the trail extension along the northern rail corridor are provided, with “rail-with-trail” and out of corridor alignments to accommodate active rail where necessary. Two route alternatives are included to provide the City of Lebanon with options if continuing the rail-with-trail as originally planned proves unfeasible. Finally, the document will present preliminary cost estimates as well as the “action plan,” recommended next steps to move forward in trail planning.



Figure No. 1: Picture of the Connecticut River

Part 1

Introduction

&

Overview

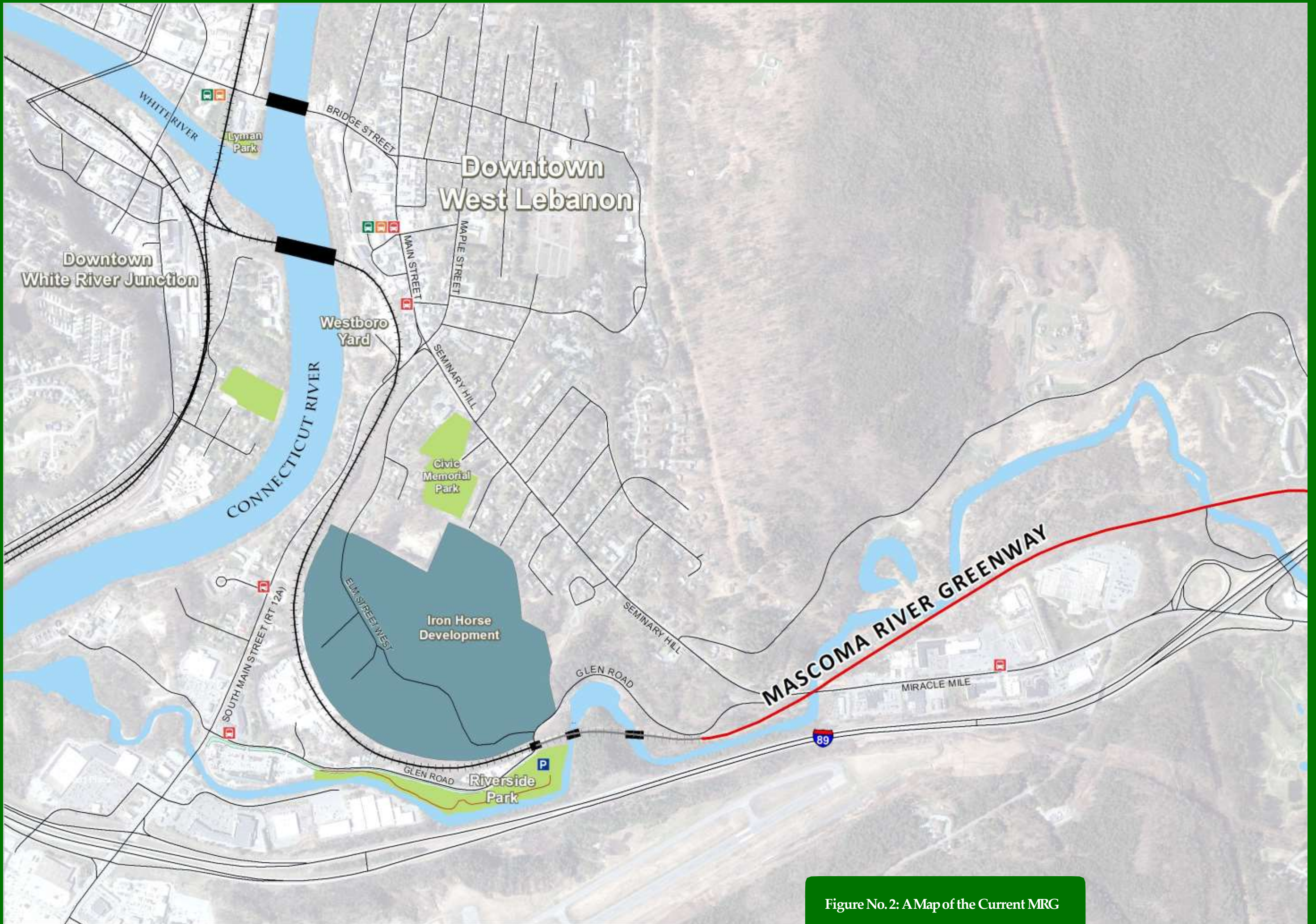
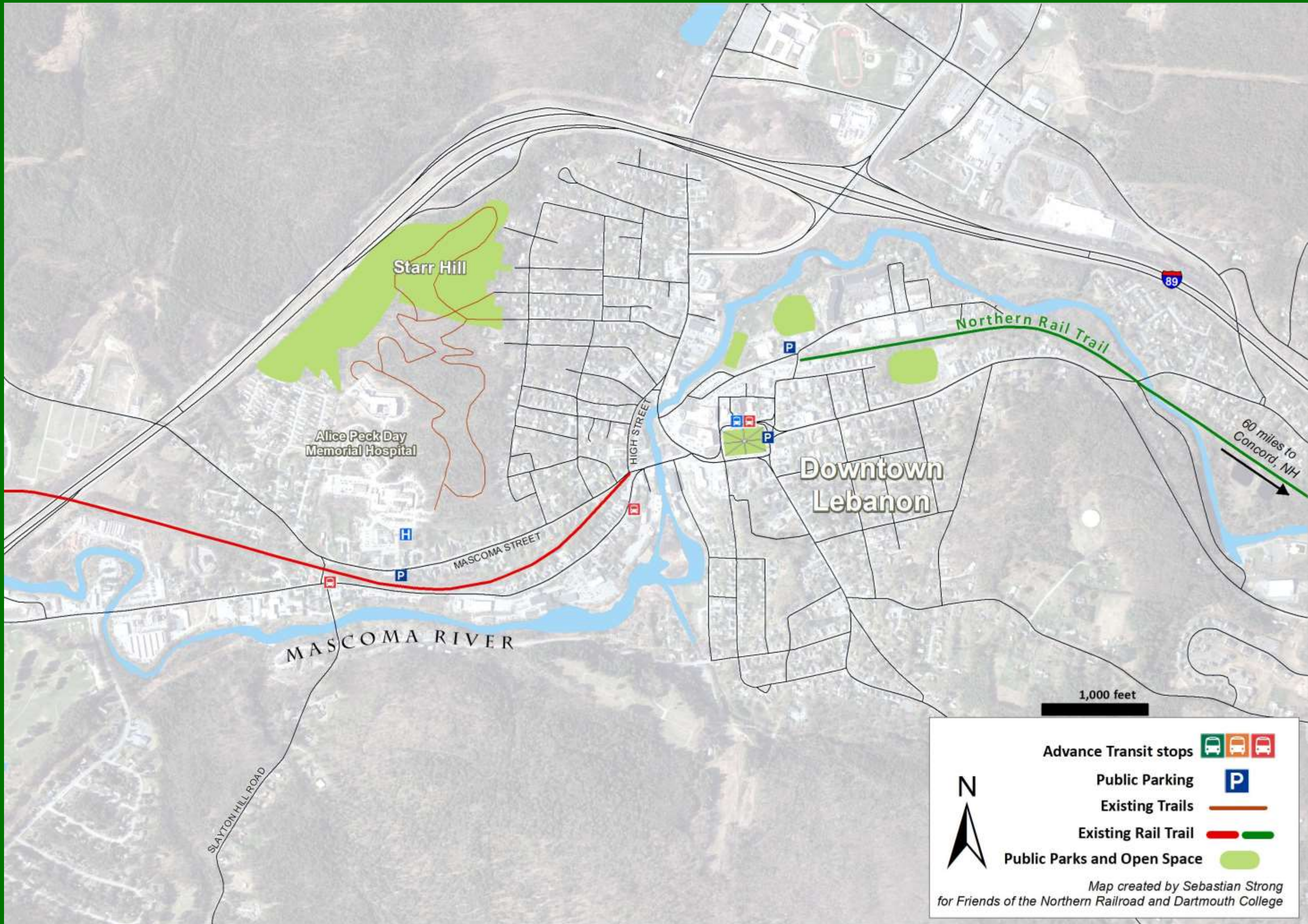


Figure No. 2: A Map of the Current MRC



Advance Transit stops   

Public Parking 

Existing Trails 

Existing Rail Trail 

Public Parks and Open Space 

*Map created by Sebastian Strong
for Friends of the Northern Railroad and Dartmouth College*

Chapter 1

Background

The Mascoma River Greenway (MRG) is the product of over two decades of community efforts in the Upper Valley. Following two miles of abandoned railroad, the MRG connects downtown Lebanon to local businesses, residences, and green space along the Mascoma River. In its completed form, the Greenway will connect the downtowns of Lebanon, West Lebanon, and White River Junction, providing accessible multimodal infrastructure, promoting community wellness through alternative recreation and transportation options, supporting economic development by connecting trail users with local businesses, and creating a bicycle-pedestrian artery through the Upper Valley. The first segment of the Greenway opened July 21, 2018 along an abandoned section of the Northern Railroad. A process called “railbanking” allowed the stretch of rail to be developed for recreational use

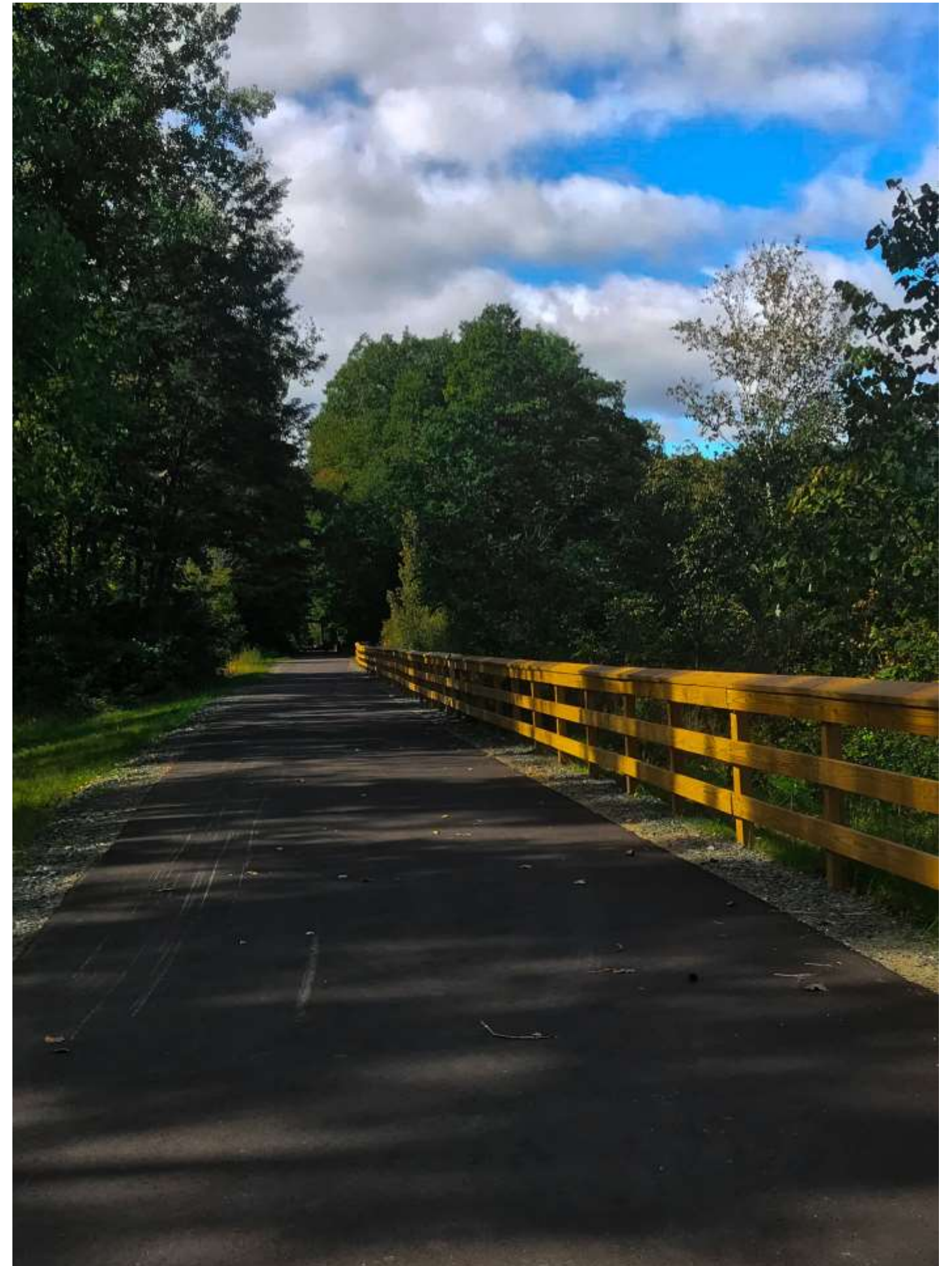


Figure No. 3: Picture of the Current MRG

through a partnership with the New Hampshire Department of Transportation (NHDOT).¹ A brief history of the legal decisions is included in the introduction to the original Action Plan,² and further historical information on the rail corridor may be found at MascomaGreenway.com.

Since the Greenway opened, the trail has quickly become popular among local residents and people working near the trail who use the trail to get outside during a lunch hour or for recreation. Others use the trail to purchase groceries on Miracle Mile or even commute to work. Despite its popularity in some circles, the Greenway has not been well advertised and is not widely known.³ In its current state, the trail lacks suitable trailhead parking, signage, and stops short of reaching West Lebanon, thus limiting its connectivity goals. As noted in the 2010 Lebanon Master Plan,⁴ sidewalks allow residents to navigate within each of the downtown centers, but connectivity between the two is limited and lacks safe, accessible pedestrian facilities. Connecting the

1 New Hampshire. Senate. Committee to Study the Use of Abandoned Railroad Beds for Recreational Purposes. Final Report. SB 80, Chapter Law 116:1

2 ORW Landscape Architects and Planners, Vanasse Hangen Brustlin, Inc., Alta Planning and Design. Mascoma River Greenway Action Plan. 2010.

3 Mackay, Dick. Personal interview. 18 February 2019

4 The Steering Committee for the Implementation of the Master Plan. "Recreation." City of Lebanon Master Plan. 2010.

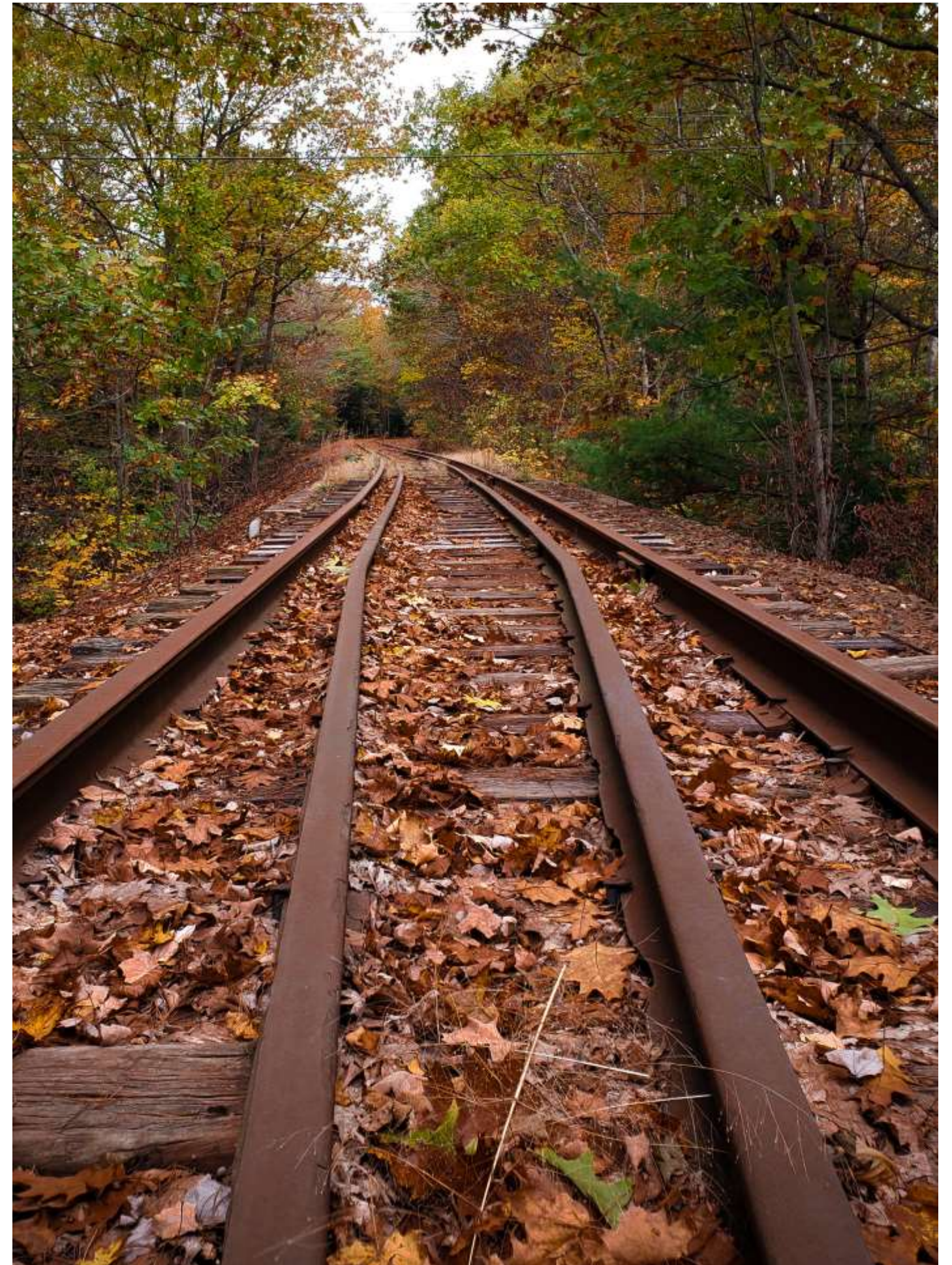


Figure No. 4: Picture of Rails Near Riverside Park

Greenway to West Lebanon stands to help meet the City's transportation needs described in the Master Plan and promote the vision of an integrated multi-modal transportation network.

Nearly every City produced document related to transportation, economic revival, access, or public health cites having multiple modes of public transport as critical to the future of Lebanon.^{5,6,7} While the NRT provides mainly recreational benefits to the region, the Greenway is an opportunity to provide equitable access for residents in the City's population centers to necessary services along the Greenway corridor. The main obstacles to completing the Greenway are Westboro Yard's redevelopment as a multi-use public space, the development of the Twin State Sand & Gravel manufacturing mine into Iron Horse Park, and difficulties obtaining further shared use of the rail corridor. Each of these barriers is complex and requires collaboration with stakeholders at the state, local, and private level to reach the desired outcome.

5 City of Lebanon. Blueprint for Community Trails: A vision for Better Walking, Biking and Living in Lebanon, New Hampshire. Unpublished.

6 ORW Landscape Architects and Planners, Vanasse Hangen Brustlin, Inc., Alta Planning and Design. Mascoma River Greenway Action Plan. 2010.

7 The Steering Committee for the Implementation of the Master Plan. City of Lebanon Master Plan. 2012.

We are students at the Thayer School of Engineering at Dartmouth College. This report was created on behalf of Dick Mackay and Friends of the Northern Rail Trail to study the feasibility of extending of the Greenway. This report outlines current conditions surrounding the extension of the Greenway to downtown West Lebanon and recommends a route to completion. Included in the report are maps detailing potential route alignments and recommendations for the type of extension based on outside research and feedback from our conversations with numerous stakeholders, decisionmakers, and community members. We hope this report provides context and insight into the present and future of the Greenway. This document is intended to be shared widely with City officials and community members and will be presented before the Lebanon City Council at the March 6th, 2019 council meeting.



THAYER SCHOOL OF
ENGINEERING
AT DARTMOUTH

Figure No. 5: Thayer School of Engineering Logo

Chapter 2

Purpose of this Extension Plan

The purpose of this document is as follows:

- To update the vision of the MRG as a means to re-energize discussion of the trail among the residents, stakeholders, and decision makers in Lebanon and the broader Upper Valley.
- To provide the conceptual design of the trail alignment for the extension of the Greenway from its current terminus at Glen Road to its intended terminus at the Bridge Street bridge, thus connecting Lebanon and West Lebanon with Vermont's White River Junction. Included in the conceptual design is a primary, preferred trail alignment as well as two alternate alignments. The alternate alignments are provided to offer the City of Lebanon options if NHDOT remains unwilling to lease co-recreational rights to the active rail corridor.
- As with the previous Action Plan, this document serves as a planning tool for the Greenway extension design, construction, and maintenance. Included with each trail alignment is a discussion of the relevant engineering, design, and safety requirements and considerations. However, these analyses are preliminary and simply provide a starting point for further analysis and refinement of the design. More detailed analysis will be required if the City opts to pursue further planning of the extension.
- This plan includes preliminary cost estimates as well as a future work section to guide the City and relevant stakeholders if they choose to move forward in the planning process.



Figure No. 6: Conducting Fieldwork Near Riverside Park

Chapter 3

Exploring the Benefits of Rail Trails

In addition to their recreational benefits, trails like the Mascoma River Greenway have the potential to provide lasting benefits environmentally, economically, and in public health and wellness, to their communities. The Rails to Trails Conservancy, an organization that encourages trail development in both abandoned and active rail corridors, describes the following as just a few benefits of rail-trails:

- Rail-trails have gentle grades and minimal road intersections, making them perfect for seniors, families, and people with disabilities.
- Rail-trails act as linear greenways through urban areas, providing much-needed open space and new recreational opportunities.

- Rail-trails promote sustainable land use and help revive historic business districts.
- Rail-trails are independent community amenities that enhance existing recreation resources by linking neighborhoods and schools to parks, waterfronts, recreation centers, and other facilities.”⁸



Figure No. 7: Cross Country Skiing on Gunflint Ski Trail
“Gunflint Trail Scenic Byway.” PICRYL, picryl.com/media/gunflint-trail-scenic-byway-cross-country-skiing-on-a-gunflint-ski-trail-d5977e.

Transportation Benefits

“People can’t get out of their cars unless we provide them another way to get where they’re going.” -Smart Growth America

Greenways and trails are an alternate transportation route

⁸ ORW Landscape Architects and Planners, Vanasse Hangen Brustlin, Inc., Alta Planning and Design. Mascoma River Greenway Action Plan. 2010.

for the community, providing users a safe means for pedestrian and bicycle recreation as well as a vehicle-free, functional means of transport. In Lebanon, the Greenway offers an accessible way to get to local businesses and places of work, allowing community members to forgo driving or using the local bus system. Businesses on the Greenway have realized this opportunity, with stores like the Miracle Mile Price Chopper installing bike racks near the entrance of their store to accommodate trail users.⁹ In a survey of local businesses along the Greenway, multiple store owners and managers reported that their employees use the trail to commute to and from work.^{10,11,12} Similarly, a study conducted by the University of Vermont found that bike commuters will extend their commutes, opting for longer routes if it means that they can do so on a trail.¹³ With the extension of the Greenway into West Lebanon, the trail will be able reach more of the Upper Valley community, providing these transportation alternatives to more people and businesses. In addition, this will provide safer

9 Atac, Sarah. "Interview with Price Chopper Manager, Jeffrey Brogan." 11 Feb. 2019

10 Atac, Sarah, et al. "Interview with Paul Coats, Lebanon Parks and Recreation Director.", Ruiz, David. n Parks and Recreation Director.", Ruiz, David.

11 "Interview with Local Businesses, Gusanoz Mexican Restaurant." 6 Feb. 2019., Web Survey.

12 "Listen Community Services." 15 Feb. 2019.

13 Aultman-Hall, Lisa & Hall, Fred & Baetz, B. (1997). Analysis of Bicycle Commuter Routes Using Geographic Information Systems: Implications for Bicycle Planning. Transportation Research Record. 1578.102-110. 10.3141/1578-13.

and more direct access for Lebanon and NRT users to reach West Lebanon, White River Junction, and Hartford.

Health Benefits

"Numerous national studies have shown that creating neighborhood places for physical activity is effective in getting people to exercise more. Studies estimate that creating or improving access to such place can result in a 25 percent increase in the number of persons who exercise at least three times a week." -Rails to Trails Conservancy

Local trails provide affordable, safe, and accessible exercise and recreation opportunities within their community. Representatives from Alice Peck Day hospital (APD) have stated that, "anything that gets people moving is good for your health... it is cheaper than medicine, and that is what we want to encourage people to do... it is a plus for public health".¹⁴ At APD, the two retirement communities on the campus frequent the trail for exercise so much that the hospital is planning to build an access trail from their parking lot to the trail, hopefully this spring. With the Greenway, community members have access to physical activity, no matter their health or economic situation.

14 Alice Peck Day, Representative. Personal Interview. 18 February. 2019

Conservation Benefits

Rail-trails like the Greenway encourage sustainable land use by repurposing rail corridors into trails instead of disturbing nature to create an entirely new path. These trails respond to their natural settings, fostering connections between trail users and the environment. The presence of a trail as an alternative transportation route helps reduce the number of vehicles on the road and subsequent emissions.

In Westboro Yard in particular, the potential conversion of the Yard into greenspace prevents alternative developments that risk disturbing the contaminated soil and bringing it to the surface. In addition, the demolition of the Westboro Yard buildings and subsequent removal of materials will eliminate the asbestos risk of any future developments. The conversion of the Yard to greenspace will both remove environmental concerns but also provide an environmentally friendly means of recreation for the community.

Economic Benefits

“Trails boost spending at local businesses. Communities along trails, often called trail towns, benefit from the influx of visitors going to restau-

rants, snack shops and other retail establishments... Trails make communities more attractive places to live. When considering where to move, homebuyers rank walking and biking paths as one of the most important features of a new community.” - Pennsylvania Land Trust Association

It is well known that trails stimulate local economies. A 2011 economic impact study of the Main Island Trail, for instance, reported that trail users spent \$1.75 million yearly in the surrounding trail towns.¹⁵ In a survey of businesses along the Greenway, most reported that the trail opening was too recent to have any measurable impact, but a few businesses have already seen increases in sales. For example, the Miracle Mile Price Chopper reported a \$5000 weekly sales increase from Greenway-related foot traffic.

While more time is needed to accurately assess the local economic impact of the Greenway, many local businesses are enthusiastic about the future sales boosts from trail users and have suggested adding more signage on the trail to direct users as well as crosswalks to get to business centers.¹⁶

¹⁵ Economic Impact Study of Main Island Trail

¹⁶ General Survey Responses

Part 2

**Project
Area**

Chapter 4

The Planning Process

This plan addresses the area west of the current Greenway terminus at Glen Road near Riverside Park to the Vermont-New Hampshire border. The proposed trail alignments follow the rail corridor to West Lebanon and end at a potential riverfront trailhead and parking lot along the Connecticut River adjacent to the Bridge Street bridge. This feasibility study considers the benefits of the completed Greenway to businesses along the corridor from Lebanon to West Lebanon and to residents in West Lebanon's main population area north and east of Main Street. A map of these businesses is included on the subsequent page.

From September 2018 to March 2019, the Dartmouth engineering students who authored this project consulted with various boards and committees of the Lebanon city government, including the Pedestrian and Bicyclist Advisory Committee, the

Recreation and Parks Commission, the Planning Board, and the City Council. In addition, the group worked closely with Dick Mackay (the project sponsor) and Friends of the Northern Rail Trail as well as local businesses and previous consultants for the trail including VHB, Shelley Hatfield, and GPI. A draft of this report was sent to relevant stakeholders, and the comments received were incorporated into the final document.

Construction of the first segment of the Greenway concluded in spring 2018, with the official planning process having begun in 2009. During that period, the Mascoma River Greenway Coalition held public meetings and hosted public workshops to develop trail alignments and incorporate community feedback. A similar coalition and feedback system is encouraged for the final extension to ensure local engagement and public momentum for the project.



Figure No. 8: Team members scouting trail end point

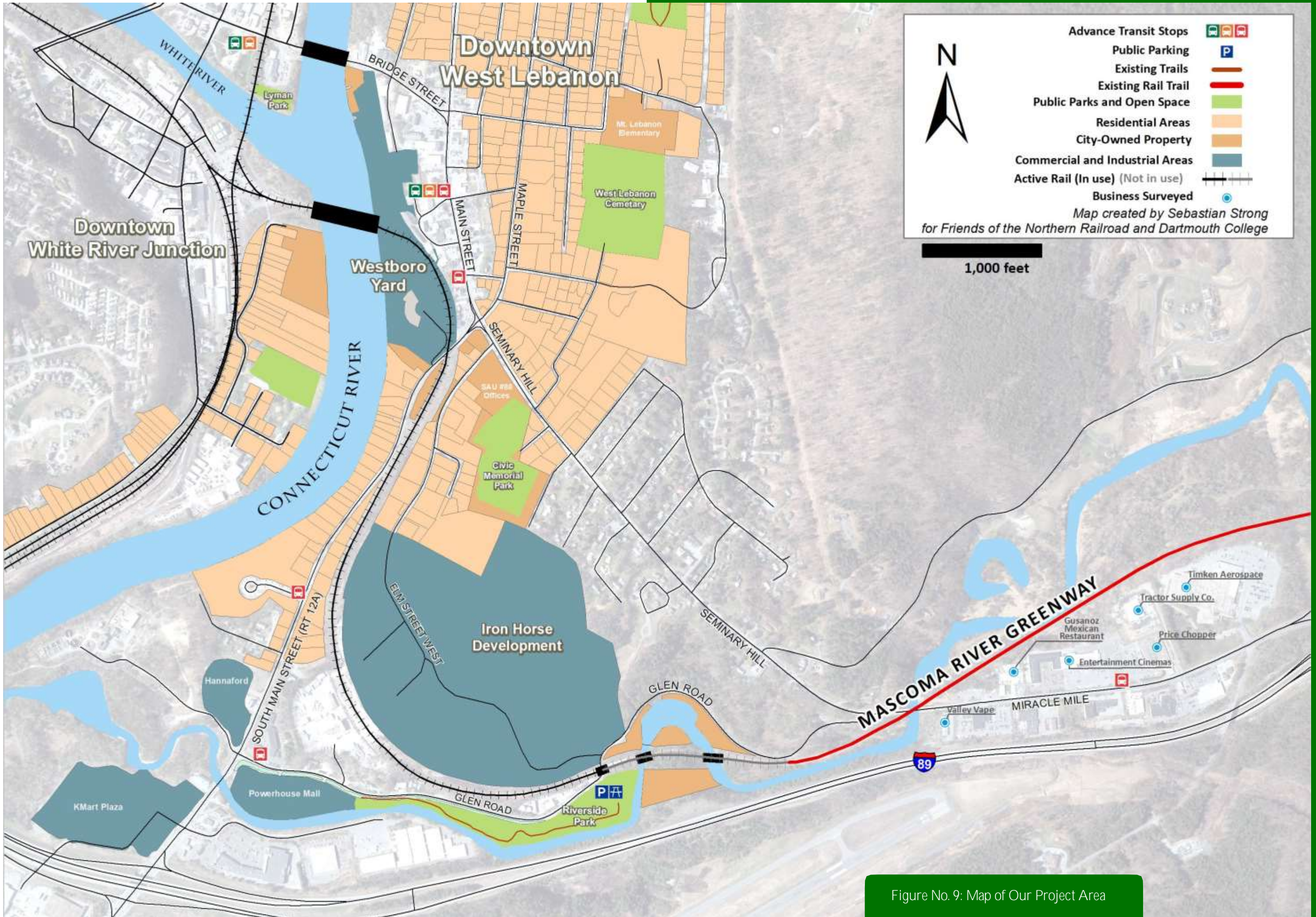


Figure No. 9: Map of Our Project Area

Chapter 5

Trail Design Considerations

Shared-Used Path

The Mascoma River Greenway is, and will continue to be, a “shared-use path”, designed for two-way travel with minimal motor vehicle interference or street crossings. The trail accommodates a myriad of users, from bicyclists, pedestrians, and cross-country skiers, to wheelchair users and walkers with strollers, among others. The wide (10-12 feet) width of the trail allows both cyclists and pedestrians to share the trail comfortably and safely away from street traffic.

As dictated in the Action Plan, the current Greenway design standards follow the American Association of State Highway and Transportation Officials (AASHTO) “Guide for the Development of Bicycle Facilities” (1999) and the New Hampshire Department of Transportation (NH DOT) “New Hampshire State Trails Plan”

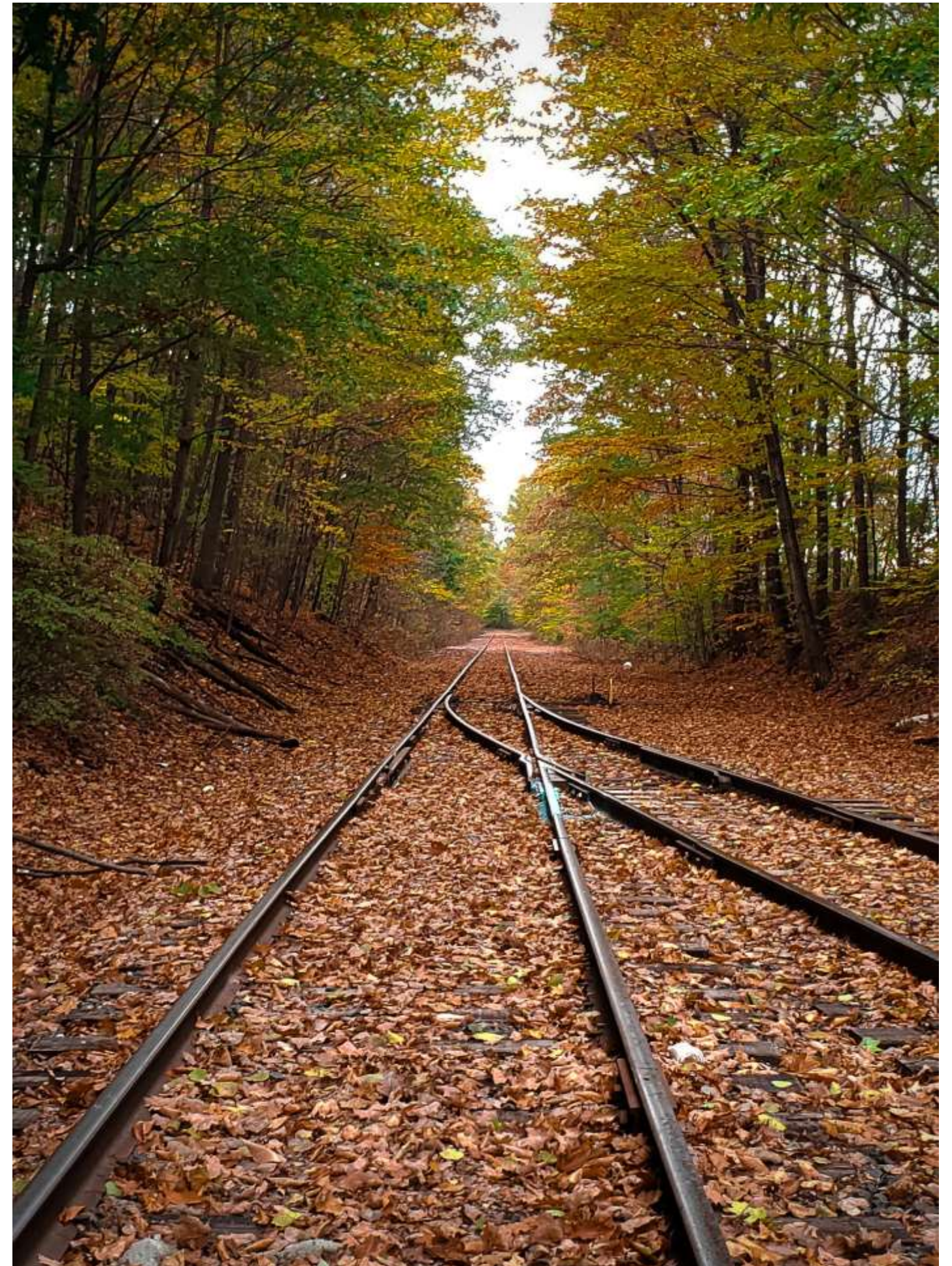


Figure No. 10: Picture of Rails Approaching Westboro Yard

(2005), as well as accessibility standards given in the Americans with Disabilities Act (ADA). For more details on the requirements and recommendations for the design standards, see the Action Plan “Shared Use Path” section.

The Greenway extension plans described in this document also follow these design standards, both in an effort maintain continuity of the trail design and also in response to feedback from local stakeholders who see the need for a wide trail.

Rail-with-Trail

The current Greenway sits on abandoned rail line and, thus, is designated a “rail-trail”, or a trail that occupies unused rail corridor. A portion of the preferred route alignment for the extension, however, sits adjacent to NHDOT-owned active rail corridor and would be designated a “rail-with-trail”, or a shared use path that runs parallel to an active rail corridor. Rails-with-trails are a growing movement in the United States, with over 161 trails in 41 states as of 2013.¹⁷ Similar to rail-trails, they are becoming increasingly popular due to their flat topography, thus making the trails accessible to all users, and location in scenic areas away

¹⁷ Pack, Kelly, and Pat Tomes. *America’s Rails With Trails*. Rails-to-Trails Conservancy, 2013.

from motor vehicle traffic. Several examples of “rail-with-trail” facilities in New England include the Island Line Rail Trail (formerly Burlington Bike Path) in Vermont, the Norwottuck Rail-Trail in Massachusetts, and the Blackstone River Bikeway in Rhode Island. While there is a common perception of safety risks to users from the railroad, rail-with-trails have a near perfect safety record, with only one reported fatality since 1992.¹⁸

If the rail-with-trail alternative for the Greenway extension is pursued, the 2013 NHDOT “Rail with Trail Design Standards” provides guidelines for “rail-with-trail” facilities. Examples of these standards include:

- **Clearances:** There must be a minimum 20’ space between the centerline of the tracks and edge of the trail, and no fencing, slopes, or other structures should be constructed within 15’ of the centerline of the tracks. Where there is not sufficient clearance, the trail should be constructed out of the rail corridor.
- **Fencing:** A 4’ chain link fence should be constructed at the edge of the trail closest to the tracks, and gates must be added at pedestrian crossings as directed by NHDOT. Fencing can be bypassed if there is a natural barrier between the rail and trail.

¹⁸ Pack, Kelly, and Pat Tomes. *America’s Rails With Trails*. Rails-to-Trails Conservancy, 2013.

- **Signage:** Signs should be added every 500' along the trail stating "Active Rail Line-Do Not Enter Track Area" as well as at every vehicle or pedestrian crossing.
- **Bridges:** No trails shall be allowed on active rail bridges. A separate bridge specifically for the trail must be constructed at least 15' away from the rail bridge.

Accessibility (ADA)

As with the first portion of the Greenway, the extension will be constructed in accordance with Americans with Disabilities Act (ADA) requirements. These requirements concern trail width, surface, and grade, and will be followed for both the trail itself as well as trail entry points.^{19,20}

Trail Markings & Signage

Safety and accessibility were key priorities in the construction of the first portion of the Greenway and remain top priorities in these extension plans. In addition to being required by the ADA and NHDOT, effective signage can help maximize user

¹⁹ United States Department of Justice. 2010 ADA Standards for Accessible Design, Action plan
²⁰ ORW Landscape Architects and Planners, Vanasse Hangen Brustlin, Inc., Alta Planning and Design. Mascoma River Greenway Action Plan. 2010.

safety and enjoyment along the Greenway. "Effective" signage includes not only installing an adequate number of signs but also carefully considering their placement and appearance along the trail. This document's proposed plans consider two broad categories of signs: regulatory signage and information markings.

Regulatory signage establishes and communicates the standard of conduct between all parties along the trail or roadway. Examples of regulatory signs include: "STOP", "SPEED LIMIT 25", and "KEEP RIGHT". These are common signs and serve to maximize the safety of drivers, pedestrians, bicyclists, and other individuals who may be using the road at any given time. The standards for size and color of these types of signs are defined in the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices and the American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities. However, while the style of these signs is regulated, there is flexibility in the placement and pairings of these regulatory signs. Both of the documents listed above as well as the National Association of City Transportation Officials' (NACTO) Urban Bikeway Design Guide were consulted in order to best meet the needs of the trail alignment alternatives

this document outlines. Please see the tables on pages 18 and 19 for examples of the signs needed for the Greenway extension and their requirements. In addition, each route alignment description includes examples of areas requiring regulatory signage specific to the respective route.

Informational markings differ from regulatory signage in that their main purpose is to enhance trail users' experience. Examples of "informational marking" signage include mile markers, wayfinders or maps, and trailheads. If implemented thoughtfully, these signs not only help users orient themselves while on the trail but also give the trail a sense of identity and showcase its integral role in the community, as well as potentially direct users to local businesses. The following recommendations should be considered in the design of the Greenway's informational markings to maximize these desired effects:

- Establish a unifying theme in the style of the markings through a shared color scheme and use of materials native to the area. On the Greenway, this may include utilizing granite and pine in the construction of mile markers or in the foundation for trailheads.

- Incorporate maps and wayfinders that communicate the user's location on the trail as well as directing them to nearby businesses and popular destinations. Further, install signs that describe the history of the trail or the area the trail sits on.
- Incorporate signs that recognize businesses and private citizens who were integral to the development of the trail.
- Install artwork created by local artists. Several points on the current Greenway include sculptures created by artists commissioned by the AVA Gallery in Lebanon.

Our team envisioned how several of these trail markings might look and have provided examples on pages 20 and 21.

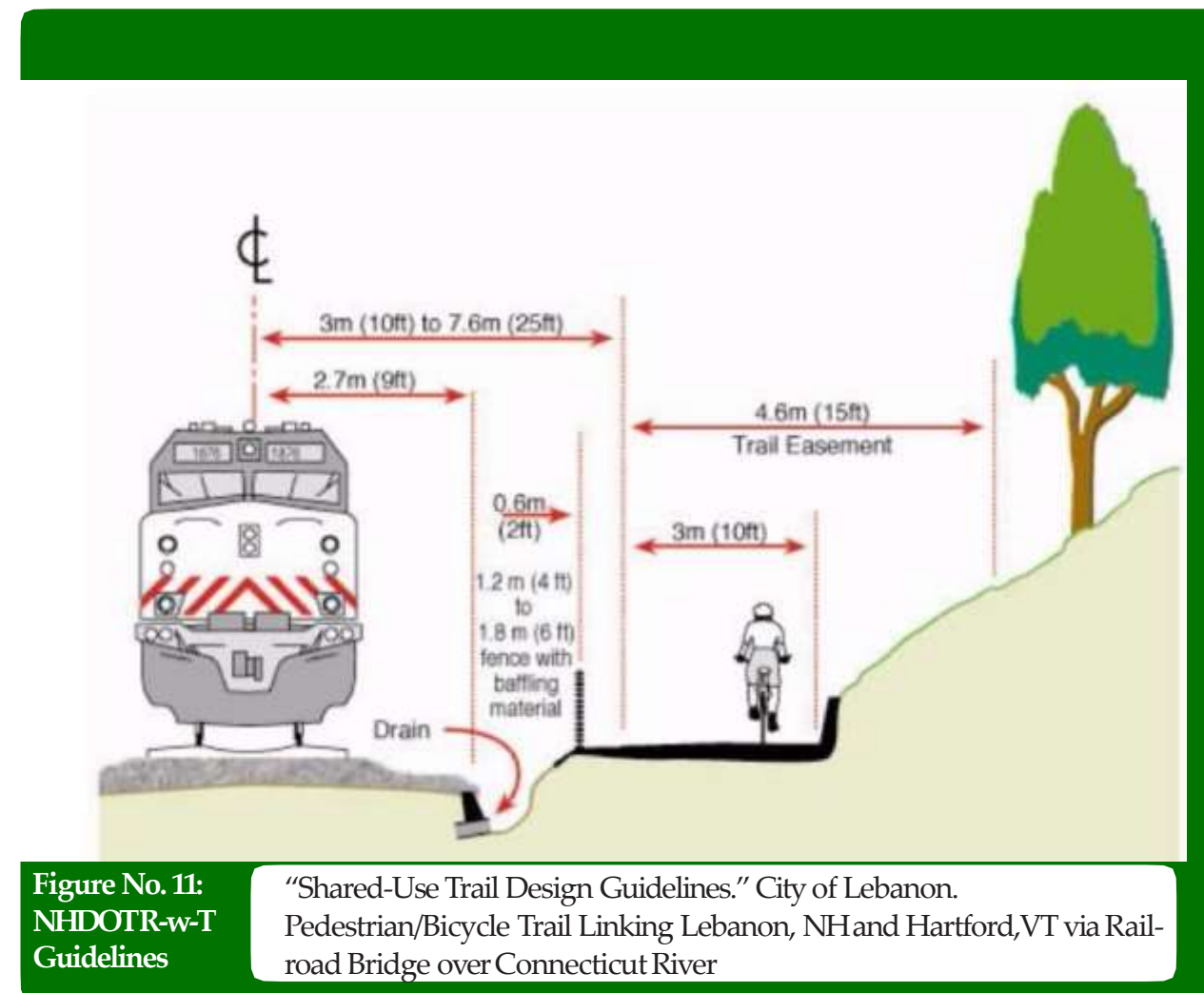


Table No. 1: Signage Requirements & Guidelines

Number	Sign Title	Requirements & Guidance
1	STOP	<ul style="list-style-type: none"> • Mandatory size on roadway: 30 x 30 in • On shared-use path: 18x 18 in • May be placed at beginning of shared-use path
2	YIELD	<ul style="list-style-type: none"> • Mandatory size on roadway: 30 x 30 in • On shared-use path: 18x 18 in • Must be installed on shared-used paths where bicyclists must give right-of-way to oncoming traffic
3	BIKE LANE (Plaque)	<ul style="list-style-type: none"> • Mandatory size: 24 x 8 in • Can only be used in conjunction with marked bike lanes • Should be placed before bike lane start and end points • Placed at periodic intervals throughout bike lane
4	NOMOTORVEHICLES & Other Selective Exclusion Signs	<ul style="list-style-type: none"> • Mandatory size: 24 x 24 in • Must be installed at the entrance to a shared-use path • Other Selective Exclusion Signs may be installed at the entrance of roadways to communicate excluded vehicles
5	WRONGWAY	<ul style="list-style-type: none"> • May be used in conjunction with 'RIDE WITH TRAFFIC' • Put back to back with other signs to minimize confusion • Place on wrong-way bicycle traffic (left side of road)
6	RIDE WITH TRAFFIC	<ul style="list-style-type: none"> • Must only be used in combination with 'WRONGWAY' sign and must be mounted directly below it

Number	Sign Title	Requirements & Guidance
7	KEEP LEFT RIGH T	<ul style="list-style-type: none"> • May be used to emphasize marked white lanes, intended to act as shared-use paths
8	Bicycle Guide Signs	<ul style="list-style-type: none"> • Install along bike routes, to signal direction changes • May be repeated regularly to inform incoming riders
9	Bicycle Warning Signs	<ul style="list-style-type: none"> • Includes signs such as 'PATH NARROWS', used to warn bicyclists of hazards not immediately apparent • Must be installed at least 50 feet in front of hazard
10	RAILROAD D CROSSIN G (Level)	<ul style="list-style-type: none"> • Indicated by white 'X' • Placed at level railroad crossing which take place tangent to the rails at designated locations • Mandatory size on road: 48 x 9 in • On shared-used path: 24 x 4.5 in
11	RAILROAD CROSSING (BIKE/ PED)	<ul style="list-style-type: none"> • Used at an intersection between a shared-use path and railroad crossing • Supplemental 'TRAIL X-ING' sign is recommended as well as a diagonal downward pointing arrow, demonstrating the location of the rail
12	Destination Signs	<ul style="list-style-type: none"> • Directional arrows should either be horizontal or vertical (sloping arrows are only to be used if the two prior options cause confusion) • Right pointing arrows must be placed on right-hand side of road; left pointing arrows placed on left-hand side • Numerical distances must be placed to the right of destination names if used

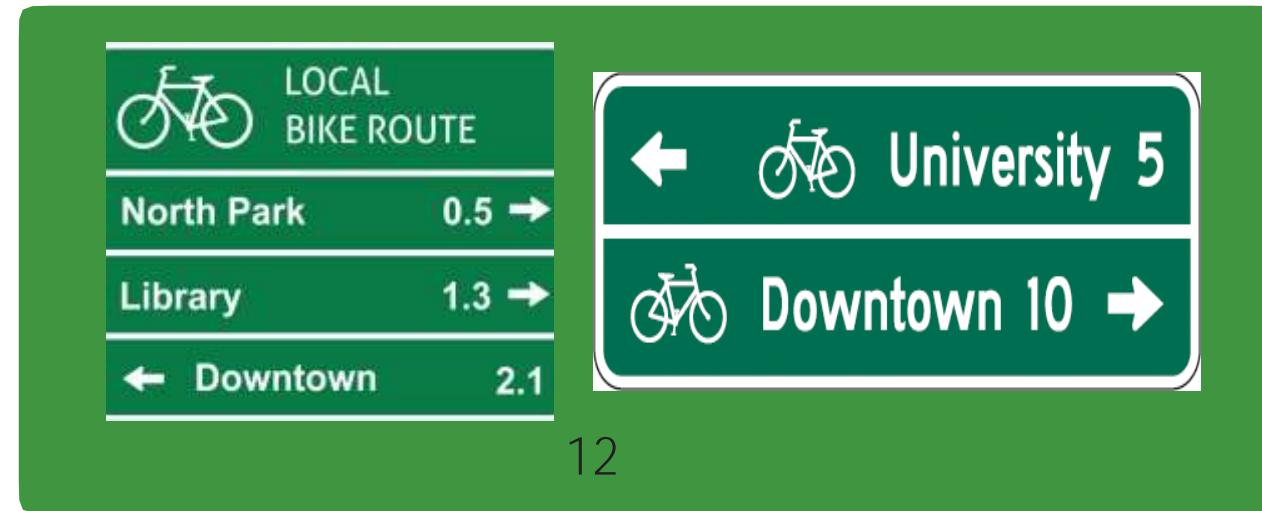


Figure No. 12:
Various Example
Signage



Figure No. 13: Examples of Current Signage on the MRG



Figure No. 14: Examples of Proposed Signage

Part 3

Proposed
Trail
Alignments

Chapter 6

Conceptual Plans

Several route alignments were considered to connect the Greenway's current terminus to the desired end in downtown West Lebanon. Options that were eliminated and do not appear in this document include: traveling along Seminary Hill Road into West Lebanon; a path passing the Lebanon Wastewater Treatment Plant; and a trail that crosses into Vermont on the I-89 bridge to travel up to White River Junction. These alignments were rejected due to inaccessibility, cost, and a desire to match the spirit of the current trail. Three trail alignment alternatives were identified as feasible, and they were subsequently evaluated against quantitative and qualitative criteria to determine the recommended extension alignment: the rail-with-trail alternative similar to what was envisioned in the original Action Plan.

The following criteria were used to assess each alternative and were weighted by importance: accessibility, affordability, connectivity, maintainability, marketability, reliability of use, safety, environmental impact, ease of use, aesthetics, and feasibility of implementation. Among these criteria, safety, reliability, connectivity, and accessibility were weighted most heavily based on the priorities of the City of Lebanon, local users, and the authors of this document. However, if future developers have different priorities, then the preferred route may change to reflect these priorities.

The following section first describes the conceptual plan for the preferred route alignment, detailing relevant engineering, safety, and design considerations as well as the connectivity of the route. Then, two alternate routes are described in a similar fashion. As previously mentioned, these are preliminary design plans. If the Greenway extension is pursued, a more detailed study of the chosen route is required for construction to occur.

Chapter 7

Rail With Trail

Trail Alignment

This alignment continues the Greenway along the rail corridor up to Westboro Yard and then has two possible endings. First, if the riverfront area in Westboro Yard is successfully turned into riverfront greenspace, the Greenway can end at this point. It can also, however, turn out of the yard and up to South Main Street where it will continue onto Maple Street. From Maple, it will turn onto Dana Street and then continue onto Bridge Street, ending at a proposed Connecticut River riverfront trailhead and parking lot. Trail users can choose to continue on across the bridge to White River Junction. As discussed in the original action plan, much of the rail is still in active use, or least classified as “active,” so rail-with-trail is incorporated to accommodate shared-use of the rail corridor.

Glen Road through Mascoma River

From the current western terminus, the Greenway will continue onto the rail corridor adjacent to Glen Road, passing over the scenic Mascoma River rail bridges and traveling toward Riverside Park. If the Iron Horse development project at Twin State Sand and Gravel moves forward, the potential realignment of Glen Road would create a natural path along the abandoned road to connect to the park.²¹ Unless the development moves forward, however, the rail-trail option should be pursued.



Figure No. 15: Riverside Park Terminus

Key engineering and design considerations for this section include the necessary removal of the overgrown rail ties to accommodate the 10-12' paved trail due to the narrow width of the

²¹ ORW Landscape Architects and Planners, Vanasse Hangen Brustlin, Inc., Alta Planning and Design. Mascoma River Greenway Action Plan. 2010.

corridor as well as the addition of fencing where the corridor borders steep slopes. The bridges themselves require the removal and replacement of the aging wooden top boards as well as fencing to ensure the safety of users. The removal of rail on the bridges is required by NHDOT regulation prohibiting bridges from including rail and trail.



Figure No. 16: Picture of a Stone Arch Bridge by Riverside Park

Riverside Park

From the Mascoma rail bridges, the Greenway will travel along the rail corridor over the stone arch bridge towards Twin State Sand and Gravel. Prior to passing over the bridge, a ramp should be constructed to create an ADAcompliant entry method to Riverside Park. The addition of the ramp will both increase

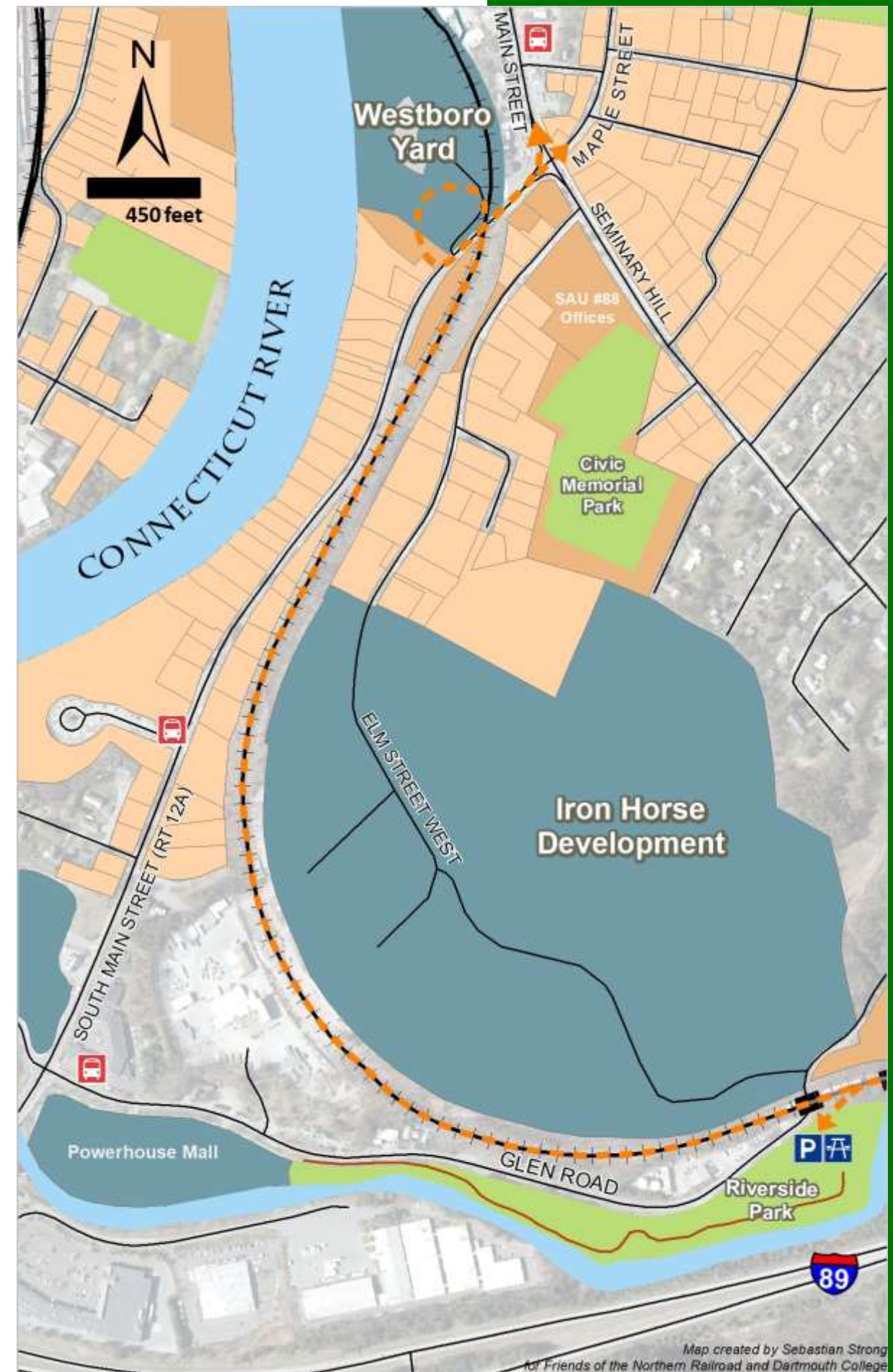


Figure No. 17:
Map of Rail-with-Trail Alignment

connectivity with the park but also provide additional parking space for trail users (see images to the right for ramp design). Until after the trail passes through the stone arch bridge, the overgrown, unused rail should be removed due to the narrow width of the corridor and fencing to protect users from the steep slopes bordering both sides of the corridor.

After crossing over the stone arch bridge and until the rail becomes double track near Twin State, the trail will become “rail-with-trail”, with the Greenway running parallel to the west side of the rail corridor. Alternately, any unused rail can be removed, and the trail will travel directly on the corridor as a “rail-trail” until it must adjust to accommodate active rail. This option allows for planners to bypass the NHDOT rail-with-trail regulations discussed above.

Twin State Sand and Gravel

The MRG will travel parallel to the corridor through Twin State Sand and Gravel land and continue northwest along the corridor to Westboro Yard, maintaining “rail-with-trail” status. As the corridor enters Twin State property, the rail becomes double track, and this continues through the grade crossing on the

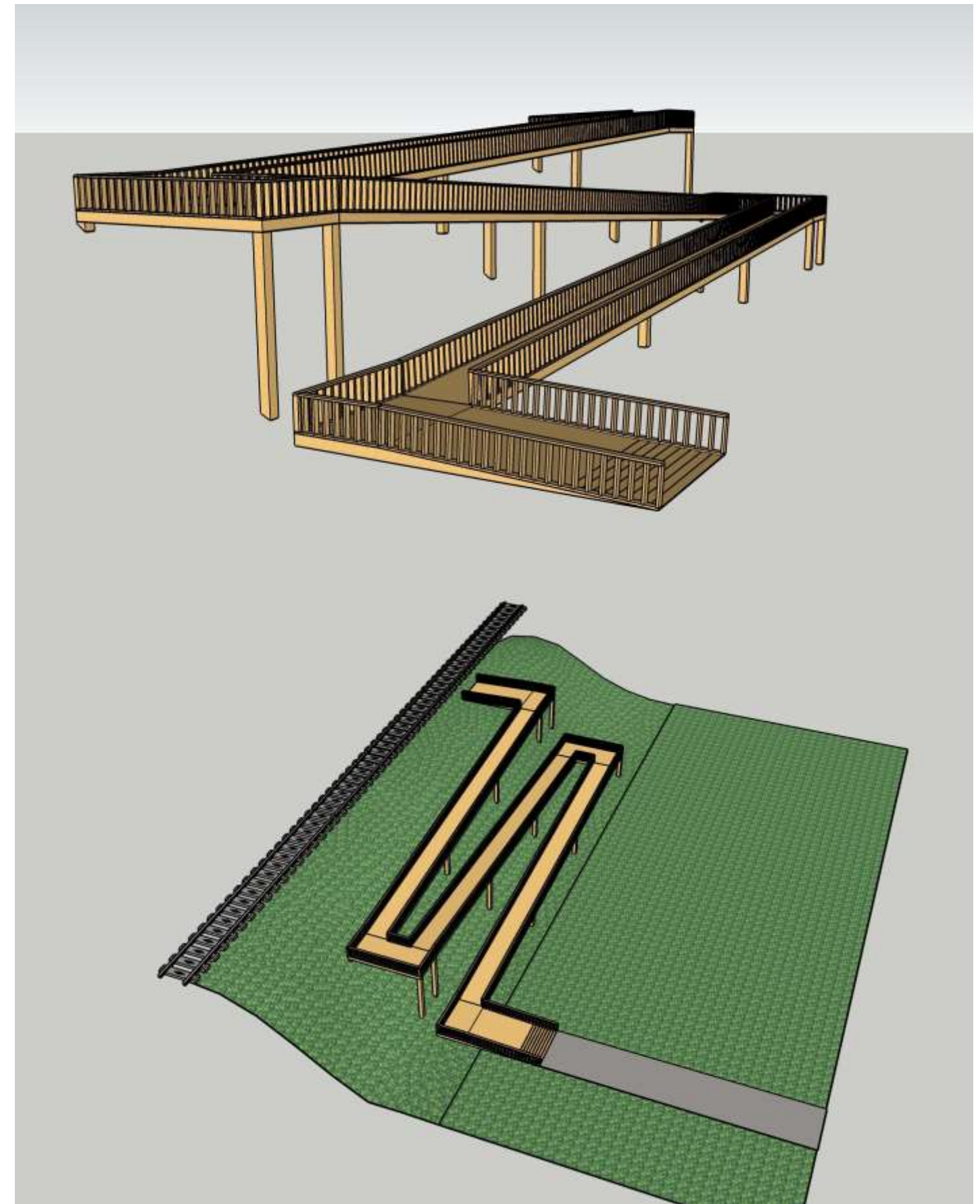


Figure No. 18: Two Views of Ramp Design

property and into the trees. Once the rail becomes double track, the City should consider working with the State to reduce the rail corridor to single track to accommodate the trail. This will keep the trail on the corridor and off Twin State property at the grade crossing. If the State is unwilling to reduce the corridor to single track, there is space to run the Greenway adjacent to the corridor. However, this will require the trail to run on Twin State property. Either way, additional safety measures for trail users on the Twin State portion of the corridor, such as pedestrian crossing lines and relevant signage, should be considered due to vehicles traveling over the crossing.

Route 12A Rail Corridor and Westboro Yard

The trail will continue along the rail corridor parallel to Route 12A, maintaining “rail-with-trail” status up through the dry bridge and into the entrance of Westboro Yard. After passing out of Twin State property, the rail merges back to single track, allowing for a paved 10-12’ trail in the corridor while maintaining NHDOT spacing and fencing regulations. The Greenway will then travel under the newly constructed dry bridge (construction is planned to begin in spring 2019) adjacent to the double tracks

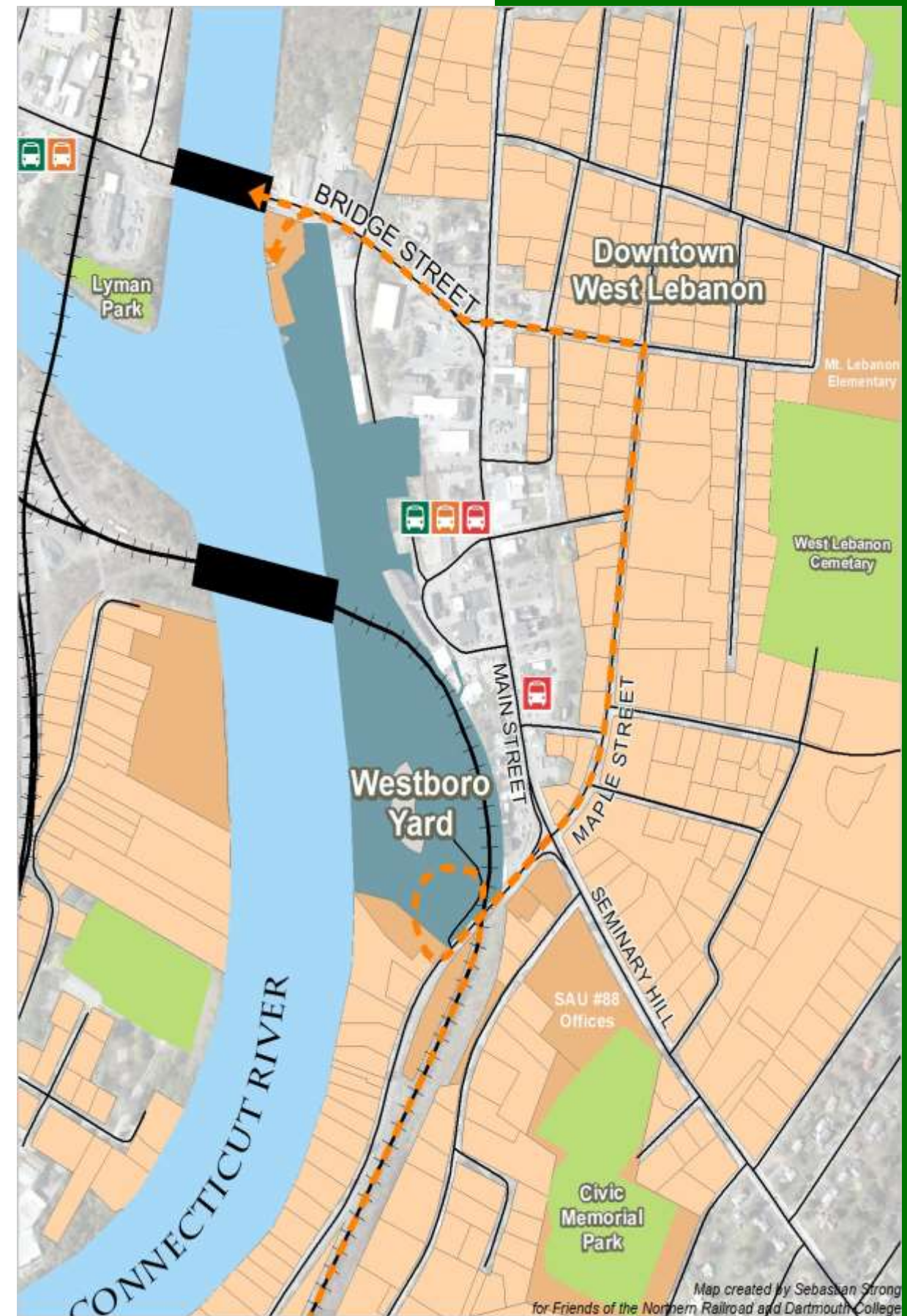


Figure No.19:
Maple St. to End Terminus

on the west side and enter Westboro yard. Upon entering the Yard, the Greenway will turn left onto the southern Yard access road and follow the road up to a City-owned land parcel on South Main Street (Route 12A). While the access road is paved, planners should consider striping the road to separate the trail from vehicle traffic and incorporating pedestrian crossing yield signs.

If the State and City of Lebanon come to an agreement to lease to the City the Westboro riverfront land south of the rail yard, the decaying yard buildings should be removed and the land turned into greenspace and a multi-use public park incorporating benefits for both the rail and the public.

Downtown West Lebanon

From the Westboro Yard access road, the Greenway will turn left onto the South Main Street (Route 12A) “dry bridge” and follow the sidewalk up to the intersection of Main Street and Maple Street. The trail will cross at the crosswalk to Maple Street and continue north on the Maple Street sidewalk. The trail will then turn left on Dana Street and follow the sidewalk to the intersection of Main Street and Bridge Street. Due to the limited width of both Maple and Dana streets and the City minimum travel lane

width requirements, the Greenway must follow along the already present sidewalk. The roads are not wide enough to add dedicated bike lanes, but the low vehicle travel speeds allow cyclists to follow with traffic if desired. Planners should consider adding trail markers along both Maple and Dana to direct trail users along the route.

Alternately, if a visioning study for West Lebanon is funded, planners may consider discussing whether to widen the sidewalks on Main Street to boulevard-style in order to realign the trail directly through the downtown area. The combination of the busy traffic and narrow or non-existent sidewalks make this option currently unattractive, but, in the future, this could greatly increase connectivity to Main St. businesses and make the area more visually appealing.

Bridge St. to Terminus

At the intersection of Bridge Street and Main Street, the Greenway will cross at the crosswalk and continue straight down Bridge Street into City-owned riverfront property adjacent to the Bridge Street bridge. Trail users will have the option to end at the riverfront or continue on across the bridge into White Riv-

er Junction. As in the previous section, the Greenway will follow along the Bridge Street sidewalk. However, the roads are considerably wider and may allow for the addition of bicycle lanes or the expansion of the sidewalk on the left side of the road. This alignment will provide connectivity with both West Lebanon and White River Junction downtown shops, increasing foot traffic in both spaces. City planners should consider, as before, adding trail markers down Bridge Street as well as a formal trailhead and trail map at the riverfront property that will serve as the terminus. This space should be turned into greenspace and a small parking lot added to both encourage pedestrians to spend time at the riverfront and provide trail users parking space if they begin the trail from the northwest end.

Connectivity

The completed Greenway would connect residents of both city population centers to businesses in the central business districts as well as along Miracle Mile, Route 12A, and Route 4. Major employers along the corridor include Alice Peck Day hospital and Timken Aerospace, both supporters of the project whose employees already benefit from trail access. Mascoma Savings

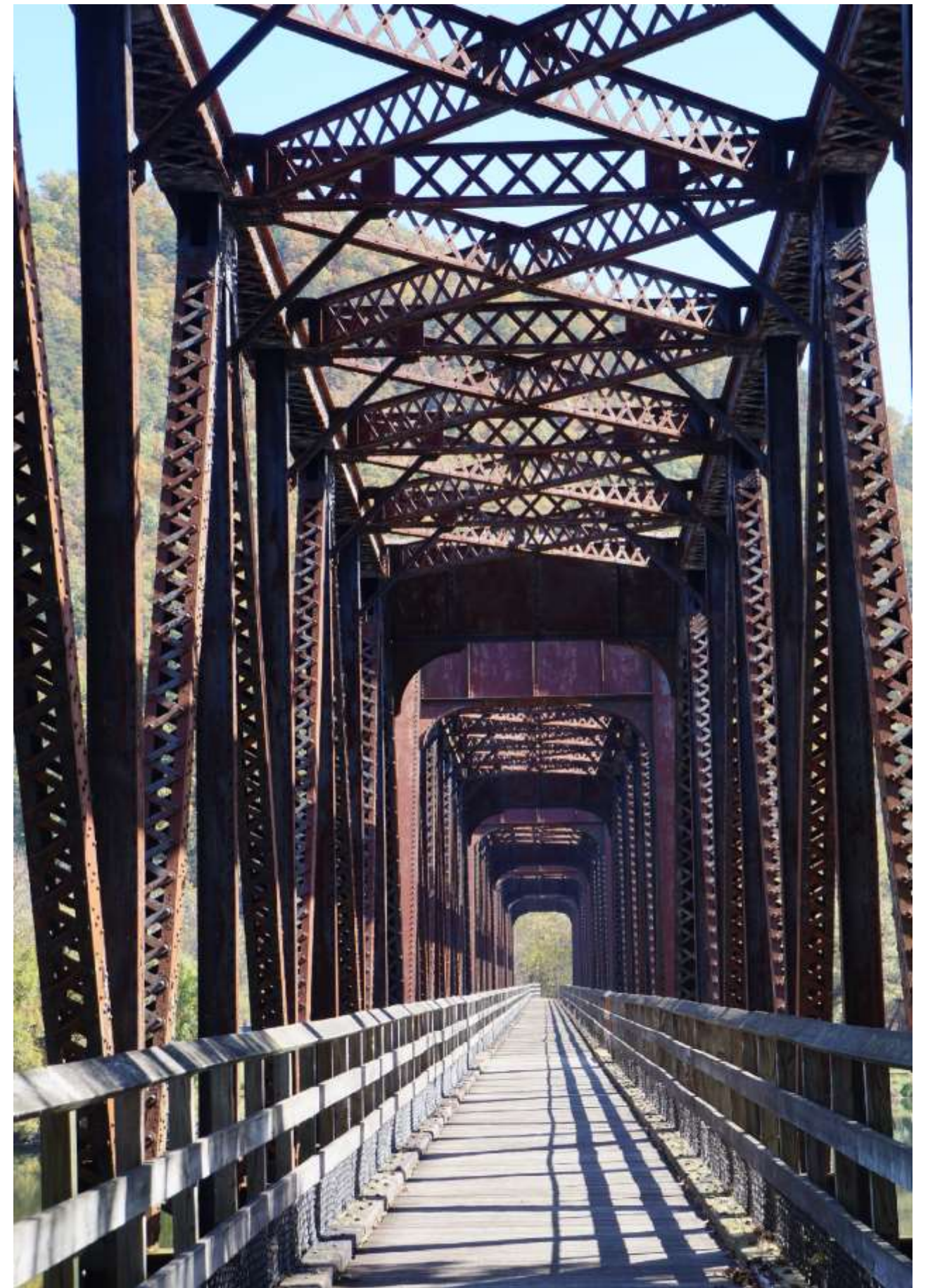


Figure No. 20: Hiwassee Bridge, New River Trail State Park, VA
"Hiwassee Bridge at New River Trail State Park_KB." Flickr, Virginia State Parks, <https://www.flickr.com/photos/vastateparksstaff/22187281813/in/photolist-zNBBTB-2ewaUvh-2e9Yr2h-29cb-BCv-AHauWN-Ahz8a9-M4uKtC>

Bank has locations in both West Lebanon and Lebanon as well as a branch in Vermont just across the Bridge Street bridge. Ending the trail at this bridge allows trail users to continue on to downtown White River Junction, providing access to more shops, businesses, and AMTRAK. In addition, this alignment provides access to the Kilton Library as well as Seminary Hill and Mt. Lebanon schools.

Well-marked trail access along the corridor at Alice Peck Day hospital, Price Chopper at Miracle Mile, Lebanon Ford, Riverside Park, and near Westboro Yard would offer opportunities for users to get off the trail and frequent local businesses. The chosen endpoint of the trail also allows users to continue into Vermont, crossing the Bridge Street bridge at White River.

Metrics

The Rail-with-Trail Greenway alternative is the preferred alignment of the three route alternatives presented in this document because it most closely matches the evaluation criteria discussed in the Conceptual Plan introduction (pg. 23). In particular, this route is the most accessible and safest alternative. The flat topography of the rail corridor makes the trail accessible to all us-

ers (and ADA compliant), and the route spends the least amount of time near roadways, providing a safe travel option for pedestrians and cyclists. This extension alternative is also extremely marketable, as it is scenic, an environmentally friendly means to repurpose old rail corridor, and a continuation of the current Greenway alignment. A marketable trail will more easily garner public and stakeholder support.

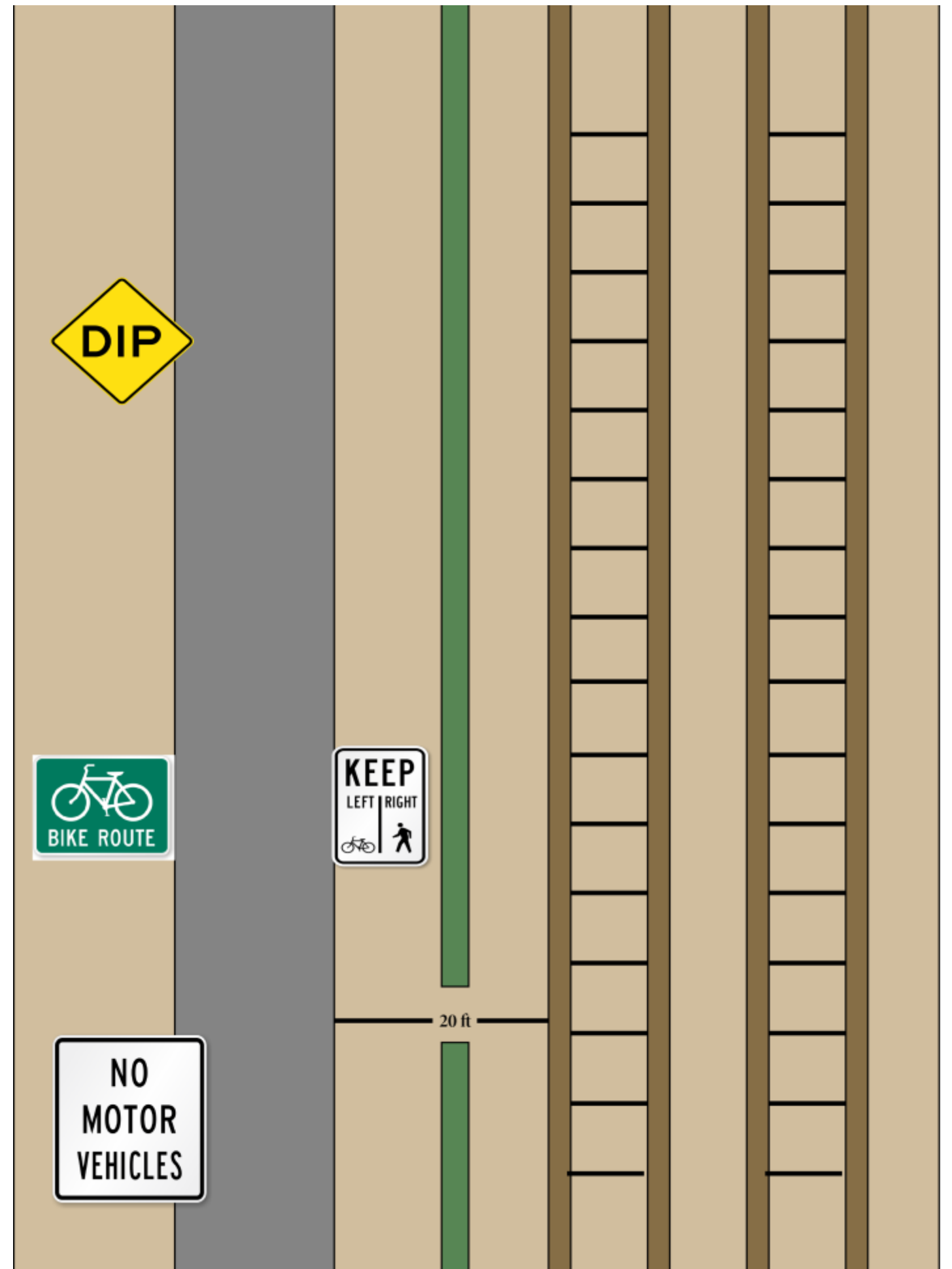
However, this alternative is not without its challenges. Currently, NH DOT is unwilling to have a trail on their corridor, even in sections which are unused and overgrown. Implementing this alternative will require significant negotiation with the State and rail company (CCRR) leasing the corridor, which will likely delay the project. Despite the barriers, the Rail-with-Trail extension alignment is the favored route of local users,²² the City of Lebanon, and other relevant stakeholders. It is the most accessible, safe, and marketable route with the greatest connectivity within the community, the fundamental goal of this project.

22 Ruiz, David. "Mascoma River Greenway User Survey." October. 2018

Safety

The diagram to the right showcases the basic layout of the rail-with-trail option; specifically, through the rail corridor approaching Westboro Yard. Its simplicity, not only conveys the overall safety of this option, but also its ease of construction. For a majority of this section the only regulatory signage needed would be those indicating:

- the legal user types - such as the 'No Motor Vehicles' sign placed at the entrance of the shared-use path
- shared-use guidelines – such as the 'Keep Left | Right' sign
- warning signs – such as the 'DIP' sign .



Alternate Routes



Chapter 8

South Main Street (Route 12A)

Trail Alignment

This alignment alternative takes the Greenway off the rail corridor at Glen Road. Instead, the trail will travel west parallel to the road on the left-side green shoulder past Riverside Park and up to the intersection with South Main Street (Route 12A). Utilizing existing pedestrian crosswalks, the Greenway will cross to the north-facing, left side of South Main Street and follow along the sidewalk north to the Westboro Access road adjacent to the “dry bridge”. From there, the route will continue as in the “Rail-with-Trail” alternative. The Greenway can either travel down the southern Yard access road into the Yard if it becomes greenspace or continue on through Maple and Dana Streets to the Bridge Street bridge terminus.

Glen Road to Riverside Park

From the current terminus, the Greenway will exit the rail corridor and merge onto the left, west-facing shoulder of Glen Road. The trail will travel west along the road’s green shoulder, under the stone arch bridge, and into Riverside Park. There is ample space to pave a 10-12’ trail along the shoulder, but planners should consider adding fencing on the outer edge of the trail when it nears the Mascoma River due to the proximity of the river dam. In addition, the stone bridge only accommodates a single vehicle lane, so no separate path can be constructed under the bridge without impinging traffic. Across walk should be painted on the left (west facing) side of the bridge underpass and flashing pedestrian crossing signs added on both sides of the bridge to ensure cars traveling in either direction can anticipate pedestrian crossings and yield accordingly.

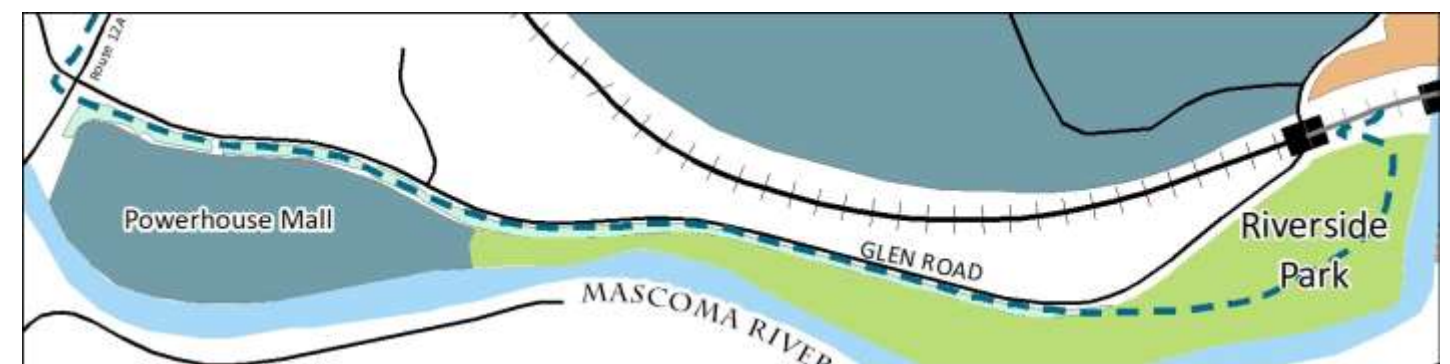


Figure No. 22: Map of Riverside Park to Powerhouse Mall

Riverside Park to Powerhouse Mall

From Riverside Park, the trail will continue west along the wide greenspace on the left shoulder of Glen Road, passing Powerhouse Mall, until the intersection of Glen Road and South Main Street (Route 12A). There is ample space to construct a 10-12' paved trail along the greenspace while keeping the trail separated from the street curb. Once the trail reaches Powerhouse mall, pedestrian crosswalks should be added at both vehicle entrances to the mall to ensure the safety of trail users as the trail passes through these entrances.

South Main Street (Route 12A)

At the intersection of South Main Street and Glen Road, the Greenway will cross the existing crosswalk to the right side of Glen Road and then travel across the South Main Street crosswalk to reach the left side. From the intersection, the trail will travel north along the existing sidewalk parallel to South Main Street up to the intersection of Maple Street and Main Street. In this section, the busy road adjacent to the route limits opportunities to construct the full 10-12' trail. Instead, planners should utilize the existing sidewalk for the pedestrian trail and consider adding

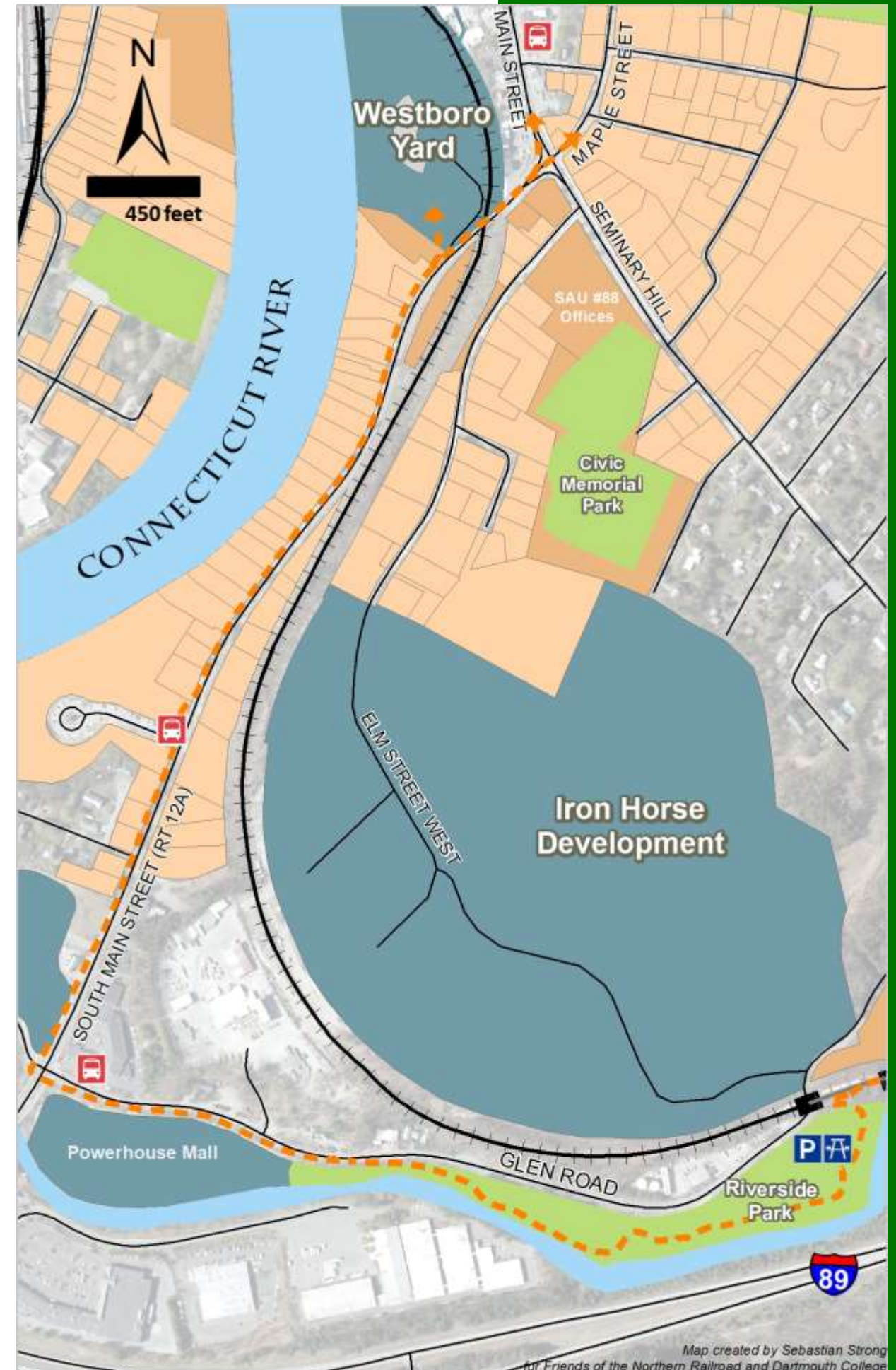


Figure No. 23: Map of South Main St. Alignment

dedicated bicycle lanes on South Main Street to ease congestion on the narrow pathway. Crosswalks should be added at the intersections of Waterman Avenue and South Main, Romano Circle and South Main, and at the entrance to Hannaford Supermarket. Further, trail markers should be incorporated along the route to guide users, as there will be no dedicated path.

South Main Street to Terminus

Finally, the Greenway will continue to the Bridge Street bridge terminus through Maple Street as described in the rail-with-trail alignment. If Westboro Yard is successfully turned into greenspace, the route can incorporate this alternate trail end by traveling down the south Yard access road into the Yard from the South Main Street sidewalk

Connectivity

The South Main Street Greenway alternative would directly connect residents to businesses along Route 12A, such as Hannaford Supermarket and shops in Powerhouse Mall. It would also connect the residential neighborhoods along the route with the trail, providing them with safe, bicycle and pedestrian access

to downtown West Lebanon, Riverside Park, and the envisioned Westboro Yard greenspace.

Metrics

This route alignment is viewed unfavorably by members of the Lebanon City government and Greenway users due to its proximity to the busy Route 12A, the narrowness of the path, and overall unattractiveness of the route. For instance, because the Greenway will travel along the sidewalk, the path will be much narrower than the desired 10-12' trail, limiting its ability to be multi-use or accessible to all users. Similarly, there is little separation between the sidewalk and road, making the trail significantly less safe. As a result, generating public support and momentum for this Greenway extension alternative would be difficult. Conversely, this alignment provides the most access to businesses along South Main Street and could be useful to community members who lack a personal vehicle, therefore meeting the goal to connect downtown areas and people.

This route fails to embody the character and spirit of the Greenway but is more feasible to implement than the Rails-with-Trail alignment and should be considered as a temporary measure. If

City planners pursue this alignment, they should consider holding an open forum with community members to understand their concerns and obtain feedback on features to incorporate to make the route more usable and pleasurable.

Safety

Included on the right, is a diagram outlining our team's suggestion to safely handling the intersection onto South Main Street. The dark green lines indicate bike lane markings in combination with the use of 'Bike Boxes'; a method outlined by NACTO's Urban Bikeway Design Guide.²³ These Bike Boxes function as areas where bicyclists can safely wait for their turn to cross the street without interfering with traffic.

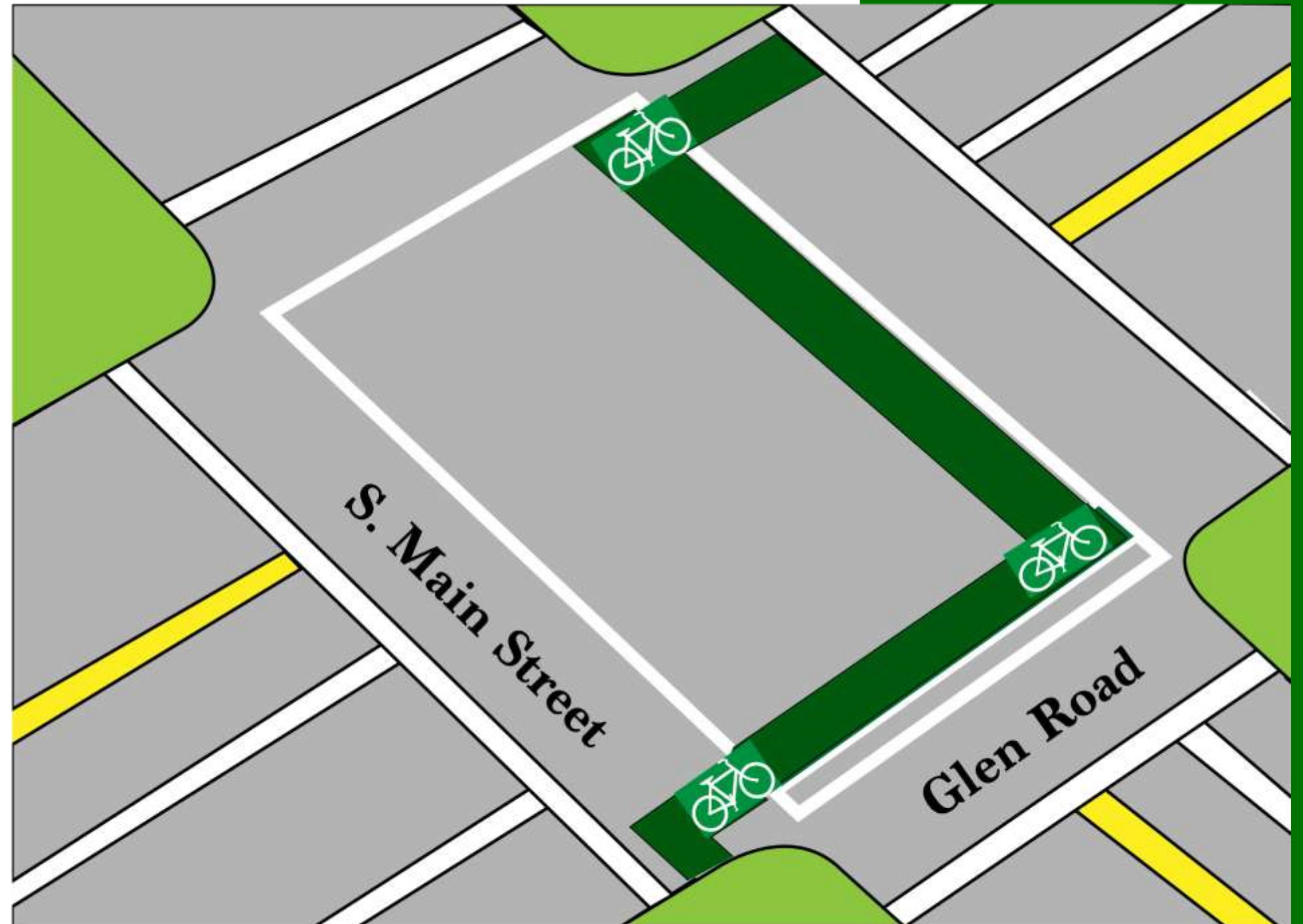


Figure No. 24: Safety Layout for South Main St. Alignment

23 Ink, Social. "Urban Bikeway Design Guide." National Association of City Transportation Officials, 13 Nov. 2017, nacto.org/publication/urban-bikeway-design-guide/.

Chapter 9

Iron Horse Development

Trail Alignment

Similar to the South Main Street alternative, this alignment leaves the rail corridor at the current terminus and travels along Glen Road toward Riverside Park. However, instead of passing under the stone arch bridge to enter the park, this alignment turns right at Elm Street and then travels through Twin State Sand and Gravel land up to Seminary Hill Road. From there, the route will turn onto Maple Street, as in the Rail-with-Trail alternative, to reach the terminus at the Bridge Street bridge. This route is contingent on the development of Twin State property into the envisioned Iron Horse Park commercial space.

Elm Street to Downtown West Lebanon

From the left shoulder of Glen Road, the Greenway will cross

to Elm Street and continue on into Twin State Sand and Gravel land where it will travel along the shoulder up to the edge of the property. There is ample room to incorporate a 10-12' trail running parallel to the road, but adding the trail will require negotiation between the City and Twin State to allow the trail on their land. From the edge of Twin State property, the trail will continue on into residential space along Elm Street. At this point, the trail will merge onto existing sidewalk because the space is too narrow to construct a 10-12' paved trail without crossing on to residential property. Finally, the trail will cross onto the far side of Seminary Hill Road and follow the street to the intersection of Main Street and Maple Street where it will continue on to the terminus through Maple as in the Rail-with-Trail alternative.

At the Glen Road to Elm Street and Elm Street to Seminary Hill Road, pedestrian crosswalks should be installed to provide safe crossing for trail users. In addition, planners should consider adding flashing pedestrian crossing signs on the Seminary Hill crossing due to the busy traffic in this area.

For details on the Glen Road to Elm Street and the Maple Street to terminus sections see the South Main Street and Rail-with-Trail alternative respective descriptions.

Iron Horse Park Development

If the Twin State property is successfully redeveloped into the proposed Iron Horse Park commercial space, this route alternative would travel through the park up to Seminary Hill Road, giving trail users access to the planned mixed-use residential and industrial zone. And, as previously discussed, the development would reroute Glen Road, allowing it to be redesigned as the Greenway. However, the future of the development remains uncertain as the City has been unable to find a developer willing to incur the costs of turning the former gravel manufacturing mine into the envisioned mixed-use space.

Connectivity

Iron Horse Park is the last remaining commercial lot available in Lebanon, and it is likely that the property will be eventually developed. A trail that runs through this land will provide users access to the Iron Horse Park residential spaces and businesses as well as connecting them to the businesses, schools, libraries, and parks in downtown West Lebanon discussed in the connectivity section of the Rail-with-Trail alternative. Even if another Greenway extension route is pursued, planners should consider incor-

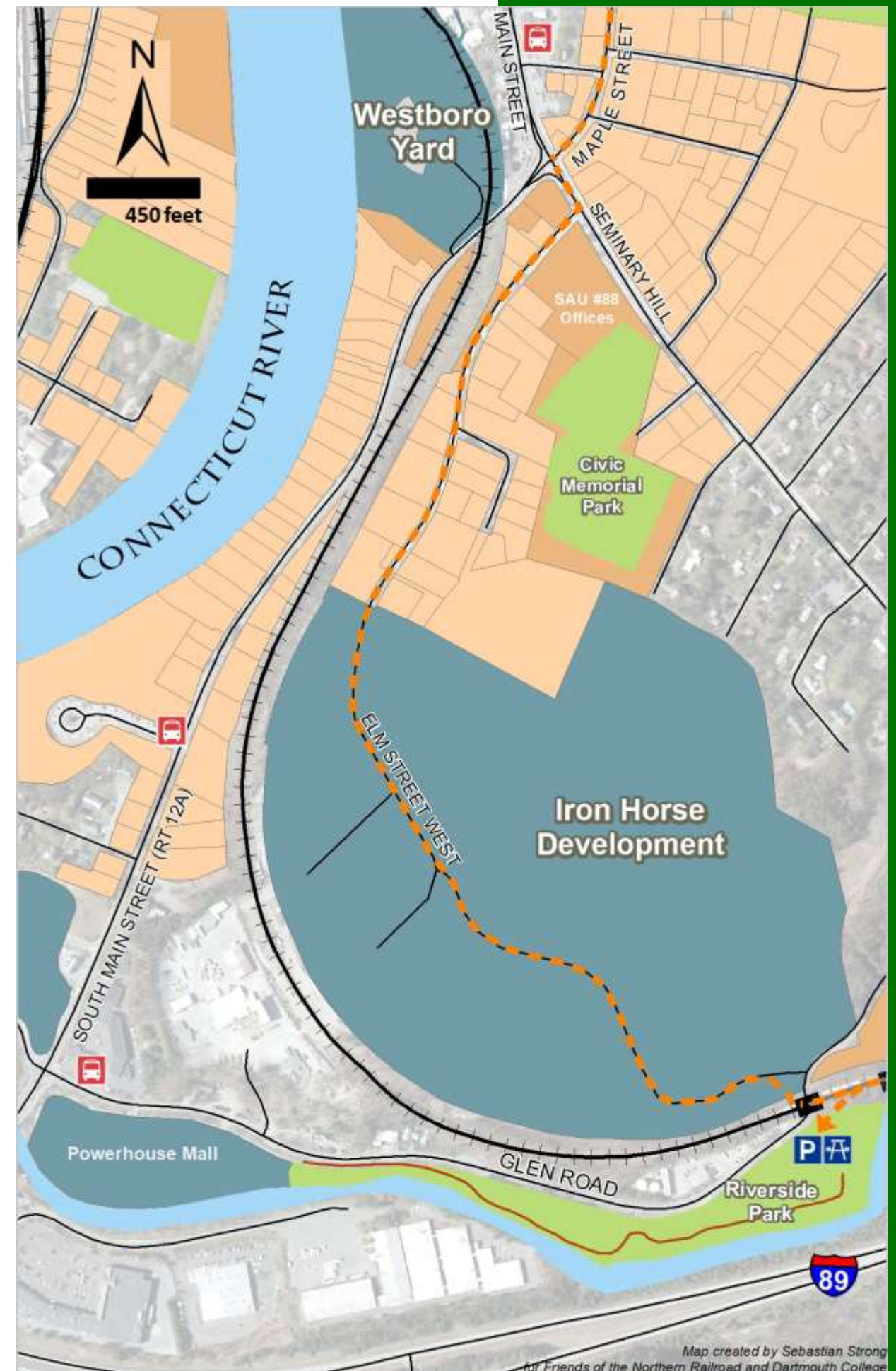


Figure No.25: Map of Iron Horse Alignment

porating bicycle and pedestrian facilities into this mixed-use development to encourage foot-traffic from the downtown area.

Metrics

The Iron Horse Park alignment was not selected as the preferred route due to uncertainty about the future development of the space as well as accessibility and usability concerns stemming from steep topography on certain sections of Elm Street and Seminary Hill Road. Both of these roads contain steep hills that would make this alternative inaccessible to many users, preventing it from maintaining ADA compliance, a requirement of the Greenway.

However, should the Iron Horse Park development be realized, this route would serve as a connector between Lebanon and West Lebanon's economic hubs, making the route more desirable. In addition, this alternative would be relatively affordable, as it does not require significant construction efforts aside from paving the trail. Since the realization of this development is uncertain and the alignment cannot be fully accessible, though, this option should not be pursued unless the other options prove impossible.

Safety

No diagram outlining key safety markings is provided in this section because the land in question is private property. Furthermore, the developers of the park would have full control in the design of the trail itself and no clear plans for the trail are available at this moment.



Figure No. 26: Users on the Mountain Division Trail
"Mountain Division Trail, ME." Flickr, Rails to Trails Conservancy, 31 Oct. 2017, www.flickr.com/photos/railstotrails/38013678196.

Part 4

Plan of Implementation

Chapter 10

Cost Summary

The following section summarizes the cost estimate analysis conducted for the Rail-with-Trail alternative of the Mascoma River Greenway extension. Included in these estimates are total cost items for design and construction, maintenance, and contingency of each section. It is assumed that the Mascoma River rail bridges are structurally sound, and all potential redesign costs for the Westboro Yard and City-owned land parcel adjacent to the Bridge Street bridge are omitted due to uncertainties about the future use of the space(s).

Construction Costs

A preliminary cost analysis estimates the total cost of the Rail-with-Trail Greenway extension from the current terminus at Glen Road to the Bridge Street Bridge to be around \$520,000. Alternate route alignments would likely be much lower due to the extensive use of existing sidewalk.

Cost by section for the Rail-with-Trail alignment are as follows:

Glen Road to Riverside Park

Estimated Cost: \$240,000

This estimate includes removal of existing rail and paving a 10-12' trail, the installation of an ADA compliant trail entry ramp at Riverside Park, informational and regulatory signage where necessary, and fencing along the path and bridges protect users from the River as well as the steep slopes bordering both sides of trail.

Riverside Park to Westboro Yard

Estimated Cost: \$280,000

This section includes removal of one rail track in areas with double track, vegetation removal where necessary to accommodate NHDOT rail-with-trail spacing requirements, paving the 10-12' path, NHDOT-mandated fencing between the rail and trail, and relevant regulatory and informational signage.

Westboro Yard to Bridge Street Parking Lot

Estimated Cost: \$500

This estimate includes regulatory and informational signage, such as a trailhead and trail markers, because this section utilizes existing sidewalk for the trail.

Operations and Maintenance

The original Action Plan(2010) included cost estimates for annual operations and maintenance of the Greenway for three different service scenarios prepared by the City of Lebanon. These cost estimates will be assumed for this extension as well, modified to match the length of the extension.

Scenario 1: Full Service Standard

This scenario assumes the Greenway is plowed 3 times per storm, with 20 storms per year, by Lebanon Division of Public Works (DPW).

Plowing: \$12,500

Mowing: \$2,000

Crosswalk Painting: \$150

Culverts/Bridges/Ramp/Misc.: \$250

Blow Downs: \$250 (removing blow downs immediately)

TOTAL: \$15,120

Scenario 2: Limited Service Standard

This scenario assumes the Greenway is plowed once per storm by Lebanon Parks and Recreation staff.

Plowing: \$1,750

Mowing: \$2,000

Crosswalk Painting: \$150

Culverts/Bridges/Ramp/Misc.: \$250

Blow Downs: \$250 (removing blow downs immediately)

TOTAL: \$4,400

Scenario 3: No Plowing

TOTAL: \$2,500

Chapter 11

Funding

Funding for the previous extension of the MRG came from over 200 different groups and individuals with donations ranging from under \$99 (“friends”) to over \$250,000 (“frontrunners”). These businesses, foundations, organizations, and individuals ultimately raised the \$2.2 million needed for the project. A similar capital campaign would be needed to fund the Greenway extension.

The success of the completed Greenway could encourage previous supporters to continue their support for the extension. The campaign should simultaneously target trail users and stakeholders as well as businesses along the proposed alignment who would benefit from the trail running near their property.

In addition, the City should seek external funding sources to complement the capital campaign. Potential sources include:

Federal

The Land and Water Conservation Fund

- This fund could be applied to costs incurred at Riverside Park and in Westboro Yard, as they run parallel to the Mascoma and Connecticut Rivers, respectively. The fund requires land ownership, which would limit funding for the Yard to land the City of Lebanon owns such as the northmost parcel that will become the Greenway terminus. The City of Lebanon owns the Riverside Park land, and this fund could be applied towards the ADA compliant trail access ramp.

Transportation Alternatives Program (TAP)

- Aimed to provide choices for non-motorized users that are safe, reliable, and convenient. It is administered by the Department of Resource and Economic Development.

NHDOT Pedestrian & Bicycle Facilities Capital

- This grant is used to integrate pedestrian and bicycle transportation with public transportation services. The proposed Greenway alignment falls within the grant constraint of 3 miles of public transportation services (bus routes down Main Street). Matching requirements would be 90% federal, 5% state, and 5% local, with maximum funding of \$200,000

State

NH State support

- Westboro Yard is owned by the State, and they could support the rejuvenation of the space of it by financially supporting the demolition of the Yard buildings. Additionally, as the land owners, the State could apply for the aforementioned Land and Water Conservation Fund on behalf of the Greenway.
- A vital avenue of support that the State could provide without significant monetary contribution is to lease Westboro Yard to the City of Lebanon for a \$1/year long-term lease. This would allow the City to redevelop the area without paying for the land itself.

NH Community Development Finance Authority (CFDA) Tax Credit Program

- The Tax Credit Program promotes community development by funding non-profit projects through local businesses getting tax credits for donating. This program is competitive but would incentivize the many local businesses along the Greenway to contribute to the trail development.
- The CFDA Community Development Investment Program (CDIP) gives a 75% state tax credit against a donation made to

any approved project. The tax credit may be applied against the New Hampshire business profits tax, business enterprise tax, and/or the insurance premium tax. The donation also may be eligible for treatment as a state and federal charitable contribution.²⁴

NH Recreational Trails Program

- Grants are available through the NH Bureau of Trails for non-motorized trails. This funding would primarily be available for the Rails-with-Trail option, as construction of paths and sidewalks adjacent to public roads are ineligible for this funding.²⁵
- Grants between \$8,000 - \$80,000 are available, and the Bureau requires a matching contribution from the applicants.

Local

Philanthropic donations

- There are many generous local organizations and foundations committed to supporting the Upper Valley community that

24 Community Development Finance Authority, "Tax Credit Program" NHCDEFA, 02/15/2019, <http://www.nhcdfa.org/tax-credits/>

25 NH State Parks, "Recreational Trails Program" NH State Parks, 02/15/2019, <https://www.nhstateparks.org/about-us/trails-bureau/grants/recreational-trails-program>

should be encouraged to donate.

- Local businesses will be likely to donate given the potential economic boost from the Greenway running near their property.
- Encourage private donations from community members and residents who utilize the existing Greenway. In addition, much of the existing trail was constructed by volunteers, and this volunteer effort should be encouraged for the remaining section.

The City of Lebanon

- The City has been instrumental to the work in this report and remains committed to the vision of the Mascoma River Greenway. As the spearheads of the project, they are likely to contribute monetarily in addition to planning and constructing the trail.



Figure No. 27: Local Volunteers Aiding with Maintenance of the MRG

Chapter 12

Action Plan

The completion of the Mascoma River Greenway will be a long-term, multi-phase project spearheaded by the City of Lebanon and will require the engagement of community members, local businesses, the state government, and local trail advocacy groups. For this project to be realized and the Greenway to be completed, there are several “next-steps” recommended below.

Step 1: Make a promotional video

- Funding has been secured for a drone video of the route to be completed in spring, 2019 that will help visualize the proposed route and explain the benefits of the trail. The promotional video can be used in the capital campaign to generate additional public support and momentum.

Step 2: Negotiations with NHDOT and CCRR

- For the proposed Rail-with-Trail alignment, Westboro Yard

south of the rail yard will need to be redeveloped and the existing buildings demolished. The City of Lebanon is currently negotiating with NHDOT for a long term \$1/year lease to the land towards a vision of mixed-use with riverfront greenspace.

- The City of Lebanon and Claremont Concord Railroad (CCRR) need to reach an agreement regarding the presence of cyclists and pedestrians near the active rail. CCRR has expressed strong reluctance to rail-with-trail, so risk management strategies must be developed to ensure CCRR’s safety concerns are mitigated.

Step 3: Petition to reclassify the overgrown railway as “inactive”

- The portion of railway from the current Greenway terminus to Riverside Park is overgrown and unusable, with the rail needing to be replaced if it were to be used again. The City of Lebanon should campaign NHDOT to re-classify this section as “inactive” to accommodate the trail. Inviting NHDOT representatives to actually walk this section could help persuade them, as it would visually demonstrate the significant effort required to make the railroad usable again.
- Alternatively, rail banking lends unusable railway to the City for recreational use under the condition that, should the railway company decide to make the section of railway usable again, they have the right to do so at any point. Given that the railway

tracks end only a few hundred feet north of Riverside Park and the trains would have nowhere to go, railbanking is a viable option NHDOT and CCRR should consider.

Step 4: Appoint Capital Campaign Chairs to begin fundraising and raising awareness

- The City of Lebanon should identify an individual, commission, or committee to oversee fundraising efforts. Several national and state grants should be pursued on an annual or semi-annual basis, and application efforts should begin immediately.

Step 5: Collect data on trail usage

- Since the 2018 opening, no data has been collected on the volume or type of trail usage. This data can be used to assess the public impact of the trail and as supporting evidence when applying for funding grants or garnering public support for the final extension. Electronic counters should be installed at several points along the trail during the warmer months to collect this data.

Step 6: Update and add additional trail kiosks and signage along current trail

- Improving signage and trail kiosks is a low-cost approach to increasing awareness and public support for the project as well

as ensuring the longevity of the current trail. The little signage that exists along the Greenway is rundown or unappealing, so implementing attractive signage can improve user experience. In addition, businesses along the trail have stated a desire for more signage to direct users to their shops.



Figure No. 28: View of the Connecticut River from End Terminus



