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Happy, Healthy, Active and Engaged: Incorporating Public Art, Planting Design, and Physical Fitness along the Norwottuck Rail Trail.

Rebekah L. DeCoursey

University of Massachusetts - Amherst, rdecourc@umass.edu

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Happy, Healthy, Active and Engaged:

Incorporating Public Art, Planting Design, and Physical Fitness along the Norwottuck Rail Trail.

Masters Project Presented

by

Rebekah L. DeCoursey

Submitted to the Graduate School of the University of Massachusetts

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Approved to style and content by:

Frank Slegers, Committee Chair

Anne Wibiralske, Committee Member

Elisabeth Hamin, Department Head

Landscape Architecture and Regional Planning

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CHAPTER 1. INTRODUCTION

Happy, healthy, active and engaged.

Applying these concepts to a person's lifestyle can significantly improve the quality of that person's life. Regular physical activity of the body and engagement of the mind have been irrefutably proven to decrease health problems and increase happiness. The goal of this project is to apply design suggestions for a 2.2 mile section of the Norwottuck Rail Trail including proposed amenities, improvements, and public art that support this wellness concept.

The project site is in Hadley, Massachusetts. The Norwottuck Rail Trail (rail trail from here forward) has undergone significant improvements over the time span of 2013-2015. Improvements included repaving and widening the existing trail surface, enhancing road crossings, upgrading trail signage, improving parking and other amenities along the entire 10.6 miles of trail from Northampton to Amherst. This rail trail project seeks to provide a site design including non-invasive vegetative plantings and public art that engages all five senses. It will embrace the native landscape and history of the area, and encourage circuit loops off the main rail trail to provide alternative physical activity options for a wide range of users.

1.1 GOALS AND OBJECTIVES

The inspiration for this project is to make structural and vegetative improvements to the Norwottuck Rail Trail that will benefit the health and lifespan of users. These improvements will enable users to integrate physical activity and engagement of the mind and body through proposed circuits, vegetative plantings, and public art.

Project Goal: The goal of this project is to provide the Department of Conservation and Recreation (DCR) and Department of Transportation (DOT) a site plan that can be applied to the rail trail that create identity using spaces, amenities, and art to give users destinations or landmarks. This project focuses on road crossings, the bordering corridor along the rail trail, and land parcels adjacent to the rail trail as sites for destinations and landmarks.

Objectives:

- Focus on a design that re-establishes non-invasive vegetative species.
- Produce a series of circuits at site, town and regional scales to provide a variety of options for physical activity along the rail trail.
- Provide site plans for each road crossing and other focus areas to create a strong identity for each site.
- Propose public art installations that can be enjoyed and appreciated by a wide range of users evoking the five senses.
- Integrate environmental design theory with landscape design principles.

1.2 JUSTIFICATION

This project will showcase rail trail improvements to promote physical activity for a wide range of users, engage users with their surroundings using non-invasive planting material, expose users to various forms of public art, provide a sense of place and identity, promote local history and resources, and offer various amenities.

CHAPTER 2. LITERATURE REVIEW

2.1 Health and Physical Activity

Physical inactivity has been proven with undeniable evidence to be a risk factor for numerous primary and secondary chronic medical conditions, including diabetes, cancer, obesity, hypertension, bone and joint disease, cardiovascular problems, premature death and depression. The greatest health benefits occur with larger amount of physical activity, but any increased levels of physical activity have been shown to reduce risk of disease (Waterburnton et al 2006, Taylor et al 1985). The American Heart Association (2014) recommends just thirty minutes of physical activity five days a week is recommended for the average adult to improve health and wellness. Many of these diseases, obesity for example, are often directly related to physical inactivity and unhealthy lifestyle habits. Changing certain behaviors also help prevent secondary conditions such as heart disease.

A study of persons 70 years old (Lubitz 2003) showed those who were in good or excellent health continued to be in good or excellent health as they aged. They also lived longer and had fewer medical expenses over this time. These people were typically folks that could walk a distance of two to three blocks, do general cooking and cleaning around the house, do their own shopping, and participated in other activities that would also be considered physical activity. Those persons already in poor health lived a shorter life (by approximately four years) and spent most of that time in fair or poor health (Lubitz 2003).

Lifestyle and healthy (or unhealthy) behaviors established in children and adolescence can influence adult behavior. Physical activity programs in youth that involve fitness training and testing can help promote positive health behavior that will benefit them through their adult life. Different physical fitness components (i.e. cardio and muscular) can promote different health outcomes, strengthening different parts of the body. Activity programs for youth should be structured around both cardiorespiratory and muscular fitness to achieve the highest level of well-rounded wellness possible. Physical fitness enhancement should be a major goal in current and future health and wellness policies (Ortega 2008).

In primitive times, humans were hunter gatherers who were constantly moving to provide for themselves while following the seasons for food. In the modern world, we have numerous luxuries that easily allow us to be inactive. We drive our cars instead of walk, we sit at

our televisions and computers, and we sit during our jobs; we even sit using our smart phones while out in parks. The consequences of this inactivity have been a national epidemic of obesity and related increases in cancer, diabetes, heart disease and more, all of which lead to premature death (Waterburnton et al, 2006).

Physical fitness has also been shown to improve psychological benefits such as improved confidence, well-being, anxiety reduction, and positive effects on depressed mood and cerebral functioning (Taylor 1985). In addition, engagement of the mind in ways that evoke the five senses: sight, sound, smell, touch, and taste also can improve psychological well-being. Some rail trail users, specifically the younger and older populations, may find they are unable to undertake vigorous physical activity, but still can engage in the surroundings through sight, sound, and touch. Incorporation of design elements and amenities along the rail trail including interactive public art pieces and visual enjoyment of ornamental plantings can bring enhanced engagement to those limited by personal mobility. This engagement in meaningful activities – being outdoors, enjoying surroundings, interacting with nature – improves mental health in users (Goldberg 2002). Engagement in meaningful activities contributes to the larger balance of well-being. This balance is not solely brought by these mentioned activities, but contributes to survival and growth needs that must be met to have a satisfied level of happiness (Sirgy & Wu 2009).

This rail trail project will focus on design strategies that can help improve the quality of physical health of users of the rail trail. This project proposes ample places for the old and young to stop and rest, and provides areas to incentivize users to walk to specific destinations – perhaps a bit farther than they might walk or ride otherwise. Proposing a planting design and propose public art that engage the senses of users. This wellness concept is one that can help improve the health and lifespan of any generation, reducing the risk of chronic disease, and also create good healthy lifestyle habits in younger groups.

2.2 SPATIAL THEORY OF LANDSCAPE DESIGN

A number of theorists have explored the way people interact with the environment around them, including built form, interpretations of space, and movement through space (Volpe 1989, Lynch 1960, Theil 1961, Appleton 1979). Volpe (1989) explains modes of space are identified by the solid and the void. These spaces have different levels of enclosure: two dimensional, three dimensional, architectural enclosures, and expanses of continuous landscapes. Spatial sensation of enclosing agents and enclosed space are determined by the degree of enclosure. This can be virtual space, apparent space, genuine or total enclosure. Each spatial composition of a space gives different character

to that space in ways of symmetry, asymmetry or serial patterns. While creating a design using these mentioned elements and methods of enhancing space, we should also be mindful of the ecology model. Volpe's (1989) model acknowledges the physical base of the earth, the biotic community living on it, and the cultural milieu of the community and residents.

The prospect refuge theory of Jay Appleton (1975) is based on primitive instinct of seeing without being seen. This theory suggests that inborn behavior of seeking shelter, such as a space with any degree of enclosure, gives the users a feeling of security. It is something that is sought after in a landscape, such as a tree to sit and lean against while reading a book, or on a bench under a shelter where one can be protected from the weather. Our inbred concern is to escape the threat, and in modern time this is an inanimate hazard such as wind or rain, and will provide shelter and even concealment from undesired elements.

Kevin Lynch's *Image of a City* (1960) identifies five physical forms of a city that can be defined as elements of any city, suburb or non-urban landscape: paths, edges, districts, nodes, and landmarks. Lynch discusses that these five elements are pieces that people generally can analyze a city by without any formal training or instruction. We take note of the *paths* or corridors that take us from one point or another. We notice the *edges* within a city, whether a change of neighborhoods or vegetative borders. *Districts* are noticed through land use, housing type, or community. *Nodes* are places of junction, places we can enter and exit or gather. And finally, *landmarks* are noticeable and identifiable parts of a city that typically cannot go unnoticed even from the untrained eye, such as the church on the corner, the town common, or the unique statue or house in a certain part of town.

The perception of visual work is a dynamic process involving spaces, surfaces, objects, and events. Philip Thiel (1961) suggests a critical discussion of encompassing both the static and dynamic experiences of three dimensional elements such as: linear perspective, motion perspective, shift in rate of motion, and transitions between light and shade. From this he formulates a basic principle that the experience of space results from the visual perception of light-defined relationships between positions and qualities of surfaces, screens, and objects (page 36). Surfaces include elements such as roofs, canopy, sky, vegetation, and platforms. Screens can be elements such as foliage and branches, railings, or grading. Objects can be wires, clouds, bollards, landforms, stepping stones, or pedestals. Grouping surfaces, screens, and objects in organization of over, side, and under positions results in spaces formed with a variety of possible combinations to represent

numerous arrangements of space. The parameter of acceleration and deceleration through these spaces contributes to an additional element of time and movement to be considered while designing such spaces.

Successful landscape designs encompass many of the aforementioned environmental theories into singular complex designs. It is the combination of these factors that accommodates the desires of numerous users, touching on for example, those who desire sun over shade, or those who prefer longer corridors for travel or exercise rather than sitting in an open space or plaza. This project will take these environmental theories of landscape design and apply them to the corridor of the Norwottuck Rail Trail. The outcome will be a diverse greenway suitable for numerous users, filled with non-invasive plantings and opportunities for intense physical fitness as well as peaceful observation and enjoyment of the trail.

CHAPTER 3: PRECEDENT STUDIES

A collection of eleven rail trails and linear greenways were examined as precedent studies for this project. Located throughout the country and varying in length and location, all these trails incorporate public art and create a variety of experiences for the user (see Appendix for complete matrix). Many incorporate a focus on numerous natural environmental features such as rivers or vistas; they provide supportive infrastructure amenities such as picnic tables or restrooms, and enhanced surrounding neighborhoods in way of beauty, linear movement, and connections to surrounding areas. Information was gathered into six main categories combining features rail trails had in common based around the management manual of Flink et al (2001). The six categories are: natural infrastructure, sporting and/or recreational features, supportive infrastructure, architectural elements, connections, and public art.

3.1 Concept Ideas of Successful Rail Trails

3.1.1 Natural Infrastructure

One of the main benefits a user obtains by accessing a rail trail is overall exposure to the natural environment. As mentioned previously in the literature review, theorists explain our experiences of the environment are enhanced in different ways through various spatial designs. Observations of the precedent studies support these design theories: users enjoy a change of environment along the trail. Examples include transitions between cool shaded enclosed areas and open sections that allow sunlight onto the trail. Outstanding

viewsheds, from specific viewpoints or just glimpses while passing by an opening through the trees, are all assets to a trail. Changes in biotic features such as transitions from open grasslands to sandy dunes to enclosed forests create a varied trail dynamic, capturing the attention of the users (Sendich 2006, Flink et al 2001).

Additional environmental features and enhancement of these features can occur through specific designs, such as adding fountains to ponds or viewing areas near bodies of water or areas known for wildlife. These types of elements are used by many as places to pause and rest or enjoy the scenery. They also become destination spots, for example birders are more apt to use areas of a trail with good habitat and viewing of bird species. The following table summarizes the twelve precedent studies in regards to the natural infrastructure each contributes to the trail, enhancing the environmental attributes of each specific trail in its own unique way.

TRAIL	LOCATION	LENGTH	NATURAL INFRASTRUCTURE
Manhan Rail Trail	Easthampton, MA	9 mi	Forested and cool areas Residential areas Arcadia Wildlife Sanctuary Overlook of CT River Oxbow
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Follows north and south shores of river's west branch
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Runs along river: stream restoration project Wildlife Trees and landscaped areas Community gardens
Legacy Trail	Lexington, KY	12 mi	Green spaces Native plant landscaping Riparian areas Rolling hills
Mill Creek Greenway	Cincinnati, OH	3 mi	Follows urban waterway Salway Park with habitat installation



Figure 1: Manhan Rail Trail, Arcadia Wildlife Sanctuary. Gazettenet.com

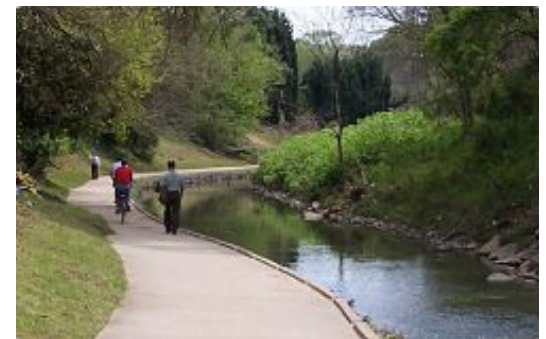


Figure 2: Little Sugar Creek Greenway. Railstotrails.org

TRAIL	LOCATION	LENGTH	NATURAL INFRASTRUCTURE
The Discovery Trail	Northwest, WA	7130 mi	Views of ocean, grassy dunes, and forest groves Exquisite wildlife Public beaches
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Parks and green spaces Community gardens Restored riparian corridor Trees and shaded areas
Chandler Bikeway	Los Angeles County, CA	2.8 mi	Wide array of trees, shrubs, and flower beds
Clipper City Rail Trail	Newburyport, MA	1.1 mi	Alchemical Garden with edible fruits, berries and two couches made of living grass Adjacent to Merrimack River at some points
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Follows and crosses several different rivers Beautiful groves of trees Bluebird box houses
Shelby Farms Greenline	Memphis, TN	6.7 mi	Shaded sections



Figure 5: Vista along the Discovery Trail. <http://www.olympicdiscoverytrail.com/>



Figure 6: Clipper City Rail Trail. Coastaltrails.org/blog



Figure 3: Shelby Farms Greenline.

<http://tsdmemphis.com/news/2015/aug/04/four-more-miles-shelby-farms-greenline/>

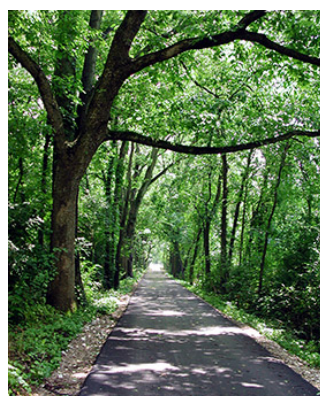


Figure 4: Fairfield Heritage Trail.

www.trailink.com/trail-photos/fairfield-heritage-trail.aspx



Figure 7: Ohlone Greenway wildflower garden. www.trailink.com/trail-photos/ohlone-greenway.aspx

3.1.2 Sporting and Recreation

As discussed by Flink et al (2001), rail trails are often considered multi-use trails that include recreational amenities catering to users other than only typical rail trail users of walkers, runners, and bicyclists. Rail trails often have nearby sporting fields or courts for activities such as basketball, tennis, skateboarding, or baseball. Any of these recreational areas on school grounds within walking distance of the trails also have high frequency of use, giving school children easy and safe access because of the close proximity. Safe routes to and from school allow children to initiate explorations with their classmates after school, as well as on educational field trips during school hours. Recreational areas can be used for school sporting events or activities of the community. In conjunction with recreational and sporting fields, playgrounds along rail trails are frequently used, particularly by younger children that may accompany their parents to the rail trail. This passive activity allows children to interact with their surroundings in a safe and controlled setting, providing them with physical activity suitable for their age and also environmental stimulation. Both of these encourage a healthy and happy lifestyle in the future (Sendich 2006).

Other sporting and recreational amenities along successful rail trails included bicycle racks at intersections, at business plazas or at parking areas. Bicycle racks create an easy and secure place for users to leave their bicycles while exploring other amenities a trail has to offer, both on or off the path. At entry points such as parking areas, having bicycle maintenance stations are common, providing simple tools anchored to a table or bench. Some trail side bicycle shops are able to provide more than just simple tools, including air, bicycle rentals, repair services, and advice. Finally, although not as common as the previously mentioned recreational amenities, some trails provide exercise equipment along the pathway, placed at intervals designed for a physical workout routine. These may include pull up bars, benches for sit-ups, or other built structures to allow the user to combine a cardio workout with a strength workout along the trail (Flink et al 2001).

TRAIL	LOCATION	LENGTH	SPORTING & RECREATION
Manhan Rail Trail	Easthampton, MA	9 mi	Skateboard park Basketball court Playground
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Soccer fields Playgrounds Basketball courts Tennis courts Swimming pool/splash pad
Legacy Trail	Lexington, KY	12 mi	
Mill Creek Greenway	Cincinnati, OH	3 mi	
The Discovery Trail	Northwest, WA	130 mi	
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Dog park Exercise equipment Playground
Chandler Bikeway	Los Angeles County, CA	2.8 mi	
Clipper City Rail Trail	Newburyport, MA	1.1 mi	
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Baseball fields Basketball courts Playground Fishing Warm up area Water fort and play area
Shelby Farms Greenline	Memphis, TN	6.7 mi	Playgrounds



Figure 10: Ohlone Greenway dog park.
http://www.yelp.com/biz_photos/ohlone-park-west-berkeley



Figure 11: Shelby Farms Greeline playground.
<http://www.cloudhiking.com/metro/chickasawSF.php>



Figure 12: Ohlone Greenway exercise equipment
<https://walkingberkeley.wordpress.com/2006/09/08/a-good-idea-at-the-time/>



Figure 8: Little Sugar Creek Greenway. Alexander Street Park with soccer fields, basketball and tennis courts.
<http://www.yelp.com/biz/alexander-street-park-charlotte>

Figure 9: Manhan Rail Trail.
 Northampton Skate Park.
 Photo by Frank Bowrys.



3.1.3 Supportive Infrastructure

Several simple amenities are recommended for rail trails to create strong supportive infrastructure. These amenities included parking areas with ample room for rail trail traffic to increase ease of access for users. Parking near rail trail entrances, rather than foot entrances, are a positive feature of a trail, with either parking lots designed for the rail trail specifically, or other on or off street parking spots. Easy to find and well signed entrances also assist with trail accessibility, making way finding and meet up points easy to locate for users. In addition to parking and entrances, Flink et al (2001) recommend designing rail trails to include amenities such as restrooms, water fountains and picnic tables. Informational and educational kiosks and signage at trailheads and along rail trails can provide information not only about regulations and directions to rail trails, but also of local history, information regarding placement of public art, funding and maintenance of the trails (Rails to Trails).

TRAIL	LOCATION	LENGTH	SUPPORTIVE INFRASTRUCTURE
Manhan Rail Trail	Easthampton, MA	9 mi	Picnic tables Parking Restrooms Water
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Benches Trash receptacles
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Outdoor shelters Picnic shelters Plazas and event areas Fountains Parking Amphitheater
Legacy Trail	Lexington, KY	12 mi	Three trailheads with parking, air and minor repair tools Stone mileage markers



Figure 13: Amphitheater at Little Sugar Creek Greenway.
<http://charmack.org/mecklenburg/>



Figure 14: Stone mileage markers along Legacy Trail.
<http://blueeyedkentucky.blogspot.com/2014/03/lexingtons-legacy-trail>

TRAIL	LOCATION	LENGTH	SUPPORTIVE INFRASTRUCTURE
Mill Creek Greenway	Cincinnati, OH	3 mi	Picnic tables Parking Restrooms Water
The Discovery Trail	Northwest, WA	130 mi	Light houses Parking Restrooms
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Interpretive kiosks about native Ohlone people
Chandler Bikeway	Los Angeles County, CA	2.8 mi	Separate marked lanes for pedestrians and bicyclist Parking
Clipper City Rail Trail	Newburyport, MA	1.1 mi	In places very wide (40'-80') space with 10' for walkers and bicyclists
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Several bridges Picnic area Informational kiosks Shelter house Parking
Shelby Farms Greenline	Memphis, TN	6.7 mi	Parking Water station



Figure 15: Chandler Bikeway
<https://labreacorridorplanningstudy.wordpress.com/>



Figure 16: Fairfield Heritage Trail
 Covered Bridge
<http://www.fhta.org/>



Figure 17: Clipper City Rail Trail
cityofnewburyport.com

3.1.4 Architectural Elements

The natural environment provides numerous positive features to a rail trail: sunshine, fresh air, plants and animals. However, the reason that these rail trails exist for recreational purposes today is because of the railroad lines that were built during the rail heyday by our ancestors. In many locations rail trails provide an escape from the built environment, from day to day routines, from claustrophobic offices. These trails also are positively enhanced through the surrounding built environment or structures built specifically to complement the trail, or as adaptive reuse of old infrastructure.

Many railroad lines turned into rail trails run alongside old mill buildings that hold historic and cultural significance to an area (Flink et al 2001). Whether these buildings have been refurbished for reuse or are in a state of disrepair, they hold historic significance and beauty. In Easthampton, Massachusetts the Eastworks mill building adjacent to the Manhan Rail Trail holds a combination of mixed uses, from art galleries to condos to the Department of Motor Vehicles. Many rail trails utilize old train equipment such as cabooses to accent trail heads or even be reused as dining areas or restrooms. Numerous successful trails have a combination of reflections from old rail use, from buildings to depots, some even using train and rail parts to accent gateways and intersections of trails. In areas that run through a combination of built landscapes such as low residential to high residential, through industrial and commercial also provided a contrast of varied terrain that kept the attention of users as they observe the change in environment as they passed through each. Other built pieces that enhance rail trails include a variety of bridges, including steel trestle bridges as well as covered bridges. Observation platforms are also popular, some providing spectacular views, others providing points of lookout for wildlife viewing and places for restful sitting.

TRAIL	LOCATION	LENGTH	ARCHITECTURAL ELEMENTS
Manhan Rail Trail	Easthampton, MA	9 mi	Easthampton business district Historical conflict/battle spur Old train depot Old mill buildings Numerous bridges
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Two bridge crossings Built atop levees Interpretive signage about the lumber heritage of the region
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Bridges Business district/dining areas Old neighborhoods
Legacy Trail	Lexington, KY	12 mi	Urban office parks Horse country Bridges Suburban neighborhoods Tunnels
Mill Creek Greenway	Cincinnati, OH	3 mi	Light industrial areas

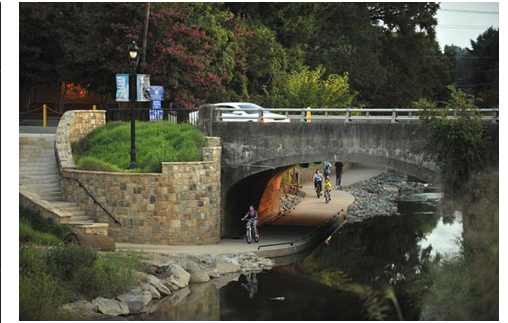


Figure 19: Little Sugar Creek Greenway. <https://ui.uncc.edu/story/vote-your-favorite-nc-great-place>



Figure 20: Manhan Rail Trail Bridge. <http://www.trailink.com/trail-photos/manhan-rail-trail.aspx>



Figure 18: Eastworks Mill Building along Manhan Rail Trail. eastworks.com



Figure 21: Susquehanna River Walk signage
Photo by: Chuck and Mellissa Gregory

TRAIL	LOCATION	LENGTH	ARCHITECTURAL ELEMENTS
The Discovery Trail	Northwest, WA	130 mi	Quaint fishing villages Lewis and Clark Interpretive Center Gateways
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Portion of trail under elevated BART line
Chandler Bikeway	Los Angeles County, CA	2.8 mi	Situated between two traffic lanes on the old railroad line Unique homes in tidy residential neighborhoods Light industrial and retail neighborhood
Clipper City Rail Trail	Newburyport, MA	1.1 mi	Coastal town Industrial area Dense neighborhoods Waterfront
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Passes by college campus Neighborhoods Crosses active railroad lines Commercial district Train Depot
Shelby Farms Greenline	Memphis, TN	6.7 mi	Railroad trestles Industrial areas Historic District Historic depot



Figure 22: Discovery Trail Long Beach Gateway.

Photo by: Allen and Donna Ferguson.



Figure 23: Shelby Farms Greenline Train Depot.

Photo by: Reg Udouj Sr

3.1.5 Connections

Some of the rail trails in the precedent study were in lengths of tens of miles, and some only a few miles. No matter what their use and purpose, any length of a rail trail is seen as beneficial to the surrounding community. In addition to previously mentioned factors that add value to a trail, such as natural and built infrastructure, other factors that control traffic on rail trails include distance to a trail and access to trail (Lindsey 2008).

Some of the shorter rail trails were just as notable as the longer rail trails because of the connections they created through some sort of linear network. Connections between different schools or universities were common for use by children, families and educators. Connections between outdoor parks and green spaces were most commonly mentioned by outdoor enthusiasts, as well as users that were looking for adventure on longer bicycle rides or travelers looking to explore a new area. Some rail trails with methodical placement of public art work became frequently used as corridors to experience this art, or present a story that is told through the art along the way. Many were also used most frequently as a commuting corridor, particularly in urban environments, but even these urban commuting corridors were also used for recreational pleasure especially when there were ornamental plantings or public art to entice recreational use (Flink et al 2001). As more and more rail road lines are being turned into rail trails, there is a conscious effort being made to connect these trails to each other where possible. The state of Massachusetts is working on the MassCentral Rail Trail, which eventually will connect the east and west portions of the state through a combination of rail trails (DCR).

TRAIL	LOCATION	LENGTH	CONNECTIONS
Manhan Rail Trail	Easthampton, MA	9 mi	Numerous entrances used by residents Connects to Norwottuck Rail Trail Spur to Mount Tom
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Creates important connection between residents and the river
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Connections between different parks Medical Center Community College Commuter route to uptown Charlotte Schools Shopping Centers Museums Plans for continuous expansion
Legacy Trail	Lexington, KY	12 mi	Connects green spaces, neighborhoods and urban parks Connects to memorial art garden
Mill Creek Greenway	Cincinnati, OH	3 mi	Connects two short disconnected segments Connects to Salway Park and Caldwell Park
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Doubles as a commuting corridor Connects parks and green spaces

TRAIL	LOCATION	LENGTH	CONNECTIONS
The Discovery Trail	Northwest, WA	130 mi	Multiple trailheads Connections to villages
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Doubles as a commuting corridor Connects parks and green spaces
Chandler Bikeway	Los Angeles County, CA	2.8 mi	
Clipper City Rail Trail	Newburyport, MA	1.1 mi	Side streets connect to various businesses and amenities Two public schools use trail for movement to downtown, waterfront, parks, etc. Connects to the MBTA commuter rail
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Links a college, high school, junior high and elementary school Connects parks, shopping and dining Adjacent to a school for developmental disabilities, with a spur called the Lancaster Sensory Trail Adjacent Senior Center Parallel 4 mi section for horseback riders Washington Township Homestead Park
Shelby Farms Greenline	Memphis, TN	6.7 mi	Linear extension of town's oldest park, Overton Park

3.1.6 Public Art

The field of public art is a wide one. Public Art is extensively used on rail trails in forms of murals, sculptures, and gardens, among other forms. Depending on location, available space and available funding, variety of public art is unique for each linear trail. Trails in more urban or dense areas tended to have the opportunity for large murals or other large sculptures. Trail-side buildings provide the perfect proximity and location for murals that reflect local history, local artists, or simple bring a splash of color to a rundown section of the trail. Many rail trails contract work with local artists, bring a strong sense of community to the trail and supporting the local artist culture. Many individual pieces are inspired from the local history and culture of an area, something a native local artist could connect with and express through their own personal style.

TRAIL	LOCATION	LENGTH	PUBLIC ART
Manhan Rail Trail	Easthampton, MA	9 mi	Millennium Mural
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Lumber-themed public art including life-sized sculpture of a lumber camp worker
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Public art pieces include individual sculptures and fountains. Interpretive kiosks and signage.
Legacy Trail	Lexington, KY	12 mi	Explores the the community's culture, history, and environmental character and revel it through public art Murals
Mill Creek Greenway	Cincinnati, OH	3 mi	Salway Park includes public art installation



Figure 24: Mural along the Manhan Rail Trail. Manhanrailtrail.org



Figure 25: Legacy Trail pavement mural. <http://blueeyedkentucky.blogspot.com/2014/03/lexingtons-legacy-trail>

TRAIL	LOCATION	LENGTH	PUBLIC ART
The Discovery Trail	Northwest, WA	130 mi	Bronze sculptures along path commemorating Lewis and Clark's journey Grey whale skeleton
Ohlone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Interactive public art
Chandler Bikeway	Los Angeles County, CA	2.8 mi	Two unique sculptures along trail Collection of murals on buildings Art honors range from movie, music, nature, railroads to harvest and farm fields
Clipper City Rail Trail	Newburyport, MA	1.1 mi	Various public art pieces along the trail including sculptures, murals, and artfully designed landscapes
Fairfield Heritage Trail	Lancaster, OH	9.5 mi	Sensory garden included potted herbs, fragrant flowers and bushes, bird feeders and houses, native trees, grasses and art pieces. Includes rough bark tactile display with Braille interpretation, and six large permanently mounted musical instruments have been custom built with tethered mallets.
Shelby Farms Greenline	Memphis, TN	6.7 mi	Broad Avenue was turned into a complete street, temporarily, with bike lanes, cross walk art, and a local bike shop taking up business for the day



Figure 26: Discovery Trail.
Photo by: Allen and Donna Ferguson.



Figure 27: Chandler Bikeway.
<http://www.trailink.com/trail/chandler-bikeway.aspx>

3.2 Conclusion: Literature Review and Precedent Studies

These studies of rail trails, bike paths, and other greenway corridors suggest that a combination of different amenities and features of the trails promotes higher frequency of use than trails without these features. Rail trails of highest use typically had a strong combination of features from more than one of the categories previously mentioned. A balance combining numerous features not only provides a picturesque trail that encompasses local environmental beauty as well as culture and history, but does this while accommodating a wide range of users.

The evidence presented here is only a portion of literature filled with facts with one common theory: physical activity contributes to sustaining a healthier person, a person finds enjoyment in engaging in meaningful activities, and that a healthier person tends to be a happier person. A person participating in a well-balanced lifestyle including physical activity, healthy habits, and engagement of the mind experiences an increase in overall happiness.

This project will embrace these wellness concepts and use environmental theory to strengthen identity along the trail. These methods will help attract the attention of users, draw users to spaces along trail encouraging them to pause and interact with the environment, as well as engage them through sensory stimulation such as sights, smells, and sounds.

CHAPTER 4: SITE ANALYSIS

4.1 Project Site

The Massachusetts Department of Conservation and Recreation (DCR) and the Massachusetts Department of Transportation (MassDOT) Highway Division have worked together to create a phased plan to rehabilitate the oldest sections of the eleven mile Norwottuck (Nor wah' tuk) Rail Trail in western Massachusetts. The entire Norwottuck Rail Trail stretches through the communities of Belchertown, Amherst, Hadley and Northampton, Massachusetts. It is used by residents and visitors for both commuting and recreational purposes. A total of 8.5 miles of the rail trail were included in the rehabilitation project. Completed in 2015, this project will be examining 2.2 miles of the trail, from Damon Road in Northampton to East Street in Hadley.

Norwottuck Rail Trail Project Site



Figure 28: Project site on the Norwottuck Rail Trail.

4.2 Background and History



Figure 29: Norwottuck Native Americans on the Connecticut River.
Northampton Historic Society.

The Norwottuck Rail Trail in western Massachusetts is constructed along an abandoned railroad line, previously operated by the Boston and Maine Railroad. The railroad was built in 1887 by the Central Massachusetts Railroad Company; soon after completion the rail line was leased to the Boston and Maine Railroad and referred to as the Central Massachusetts Branch. The rail line connected the city of Boston to Northampton. By the 1920s there were three round-trip passenger trains and numerous freight trains that traveled the connection between the two cities. Over time the use of automobiles and trucking companies transitioned the use of the railroad to these alternative travel and transportation options. The passenger rail continued until 1932, after which the freight continued

until 1979 (DCR 2009).

In 1985 the property was acquired by what is now called the Department of Conservation and Recreation. In 1993 the rail bed was developed into a recreational trail. By suggestion of the Hadley Historical Commission, the rail trail was named Norwottuck which translated to “in the midst of the river” by the area’s original Native American inhabitants (DCR 2009). The construction that began in 1992 included the renovation of bridges, building underpasses and paving of the surface (Johnstone 1996). Before the new rehabilitation project, the rail trail consisted of an 8.33 foot wide path that ran for eleven miles and was originally paved with recycled glass as part of the aggregate material. Over years of usage, growth of tree roots pushed up the pavement along the rail trail, exposing shards of glass which had been known to puncture bicycle tires (PVPC 2003). The Norwottuck Rail Trail Improvement Project has worked to design a plan to rehabilitate the path. This project included numerous changes such as improvements to paving material, widening the path, improved parking, universal access (associated with the Americans with Disabilities Act) and enhancing road crossings. Funding for the rehabilitation project was secured by former Congressman John Olver with \$4.4 million federal grant in 2004.

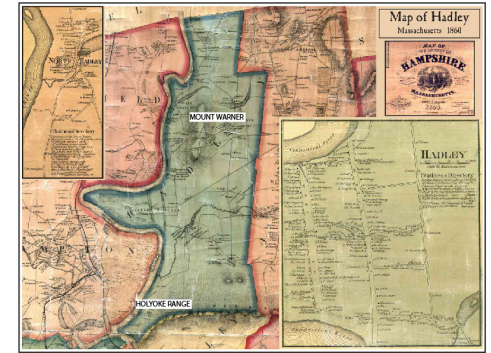


Figure 30: Historic Map of Hadley.
Hadley Historical Society.



Figure 31: The Norwottuck Rail Trail was in great need of resurfacing.
Hampshire Daily Gazette

4.3 Regional Resources

Cultural Resources

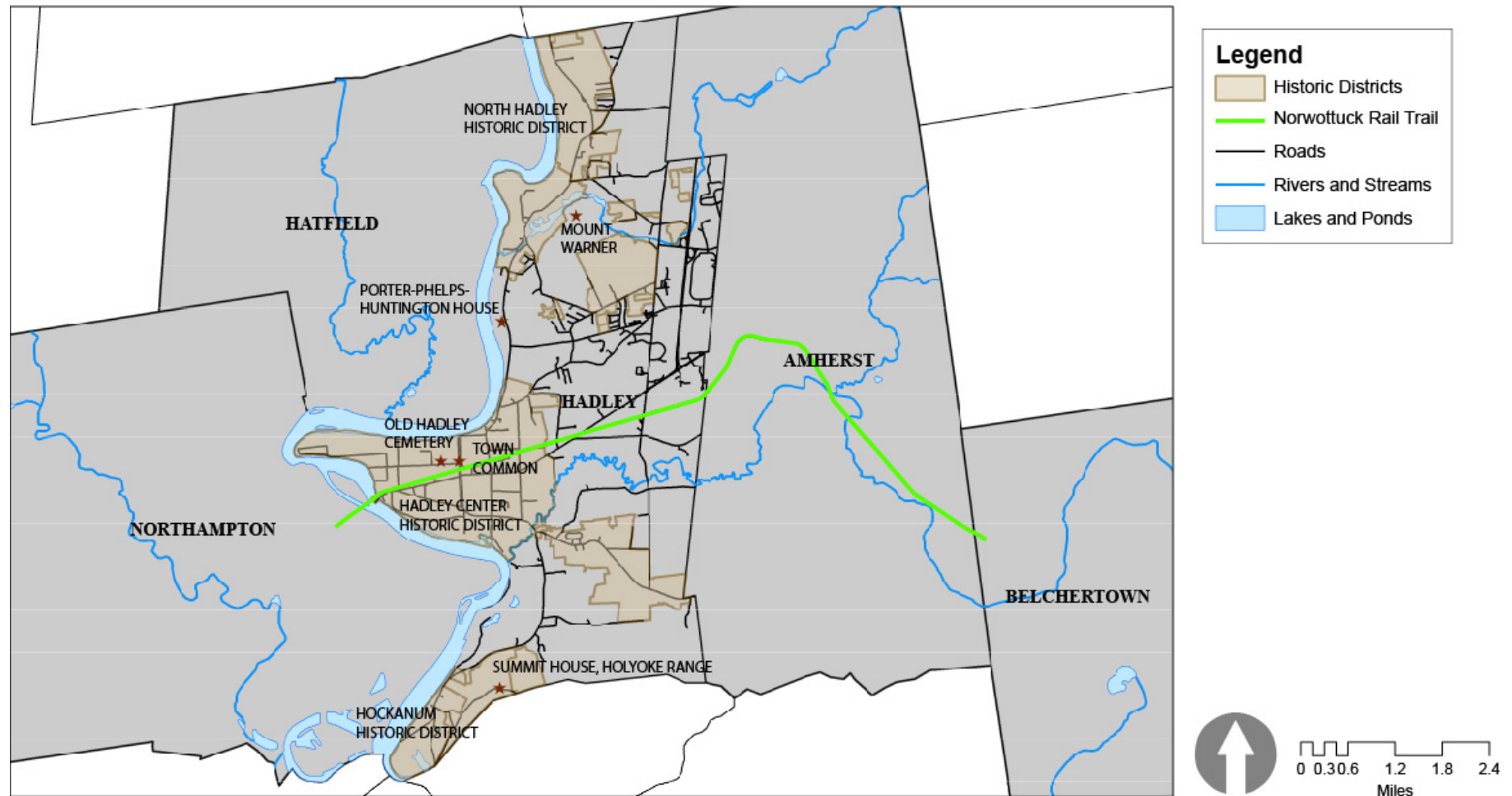


Figure 32: Cultural Resources of Hadley, Massachusetts. Including historic districts and historic points.

4.3.1 A Cultural History of Hadley

The town of Hadley was originally part of Northampton lands, called Norwottuck named after the Native Americans that first settled the land, on the east side of the Connecticut River. The land was granted to Connecticut settlers in 1659 as Hadley Plantation and established as a town in 1661. Over following one hundred years, various sections of Hadley Plantation broke off to form other incorporated towns; the final adjustments to the town's political boundaries occurred in 1850. Settled in the fertile soil of the Connecticut River and at the base of the Holyoke Range, the terrain in Hadley is primarily floodplains and low elevation. The uplands consist of Mount Warner (514') in north central Hadley, and the Holyoke Range (878') located at the town's southern border. The town covers 24.75 square miles with a population of just over 5,000 as of 2010 (Lombardo 1997).

Agriculture developed as the primary economic activity during the Colonial Period (1675-1775). A few of the mid-18th century mansion houses of this era remain along River Drive (northern Route 47), including the Porter-Phelps-Huntington homestead, as well as homesteads with farmsteads intact along Hockanum Road (southern Route 47). Although economic diversity never has trended very far from agriculture, Hadley was a very productive agricultural community and likely exported its crops to many, if not all, of the surrounding towns. To this day, Hadley's agriculture has a strong presence in town representing a long standing tradition of family homesteads and economic viability. The Great Meadow area of town had been used for farming since the time of original settlements, the fertile floodplain soil is an important part of Hadley's history (Lombardo 1997).

A number of Hadley's wonderful historic assets are within the proximity of this project. There are historic railroad buildings and rail related history along the rail trail. There are historic homes along the town common and historic districts encompassing areas of town that have been around for centuries. The following is a compilation of the assets of Hadley considered most important for this project, identified by either proximity to the project site or the historic significance to the town as a whole. There are numerous historic buildings, structures, districts, and monuments within the town of Hadley, all very important to the town's past, but not all are highlighted in this project.

4.3.2 Significant Historic Points

Hadley Center Historic District – recognized by the National Register of Historic Places, the Hadley Center Historic District covers 2,500-acres including the historic center of Hadley. The district encompasses the town common and 17 buildings that face it. It is located at the junction of Russell Street (Route 9) and Middle Street (Route 47) (Hadley Center Historic District 2014). This area is noted for its current and historic beauty. Other significant historic points in this district are:

- Old Hadley Cemetery – Old Hadley Cemetery preserves a wide range of early Colonial gravestones in original setting, located on Cemetery Road. The decision to build the Hadley dike was partially to protect this historic cemetery.
- Third church of the First Parish – built in 1806, this church is located at 102 Middle Street. The church is an excellent example of Federal ecclesiastical architecture, distinguished by its elaborate four stage steeple. The steeple consists of two square lower stages (one with a lower, arched belfry) surmounted by an octagonal stage and spire; balustrades with urns and pinnacles add further ornament.
- Town Hall – located at the village center on Middle Street and built in 1841, this Greek Revival style building includes a Doric portico
- The Northampton Lattice Truss Bridge - also known as the River Truss Bridge or the Norwottuck Rail Trail Bridge is a former crossing of the Boston and Maine Railroad over the Connecticut River. The bridge connects Northampton and Hadley. It is an eight span steel lattice truss bridge. It crosses Elwell Island, but does not provide access to the island in an attempt to leave the island otherwise untouched. It was built by the R.F. Hawkins Ironworks Company and opened in 1887 with a 200' span. The bridge was redesigned by Vanasse Hangan Brustlin, Inc of Watertown, MA, rebuilt by MassHighway, and opened in 1992 to bicycle and foot traffic as part of the Norwottuck Rail Trail.
- Goodwin Library – built in 1902 at 50 Middle Street, a brick building with hip roofs and Colonial Revival details such as Palladian windows, modillion cornices and Georgian porches. The library is constructed in Craftsman style.



Figure 33: The Northampton Lattice Truss Bridge. Library of Congress

- Cooley Dickinson Bridge – built in 1936 provided an easier transportation route for goods and travelers, it replaced the local ferry service. Art Deco period details adorn each end of the bridge.

Hockanum Historic District – recognized by the National Register of Historic Places, the Hockanum Historic District boundaries run from Hockanum Cemetery in the southwest of town, following the Connecticut River and the summit ridge of Mount Holyoke to the northeast corner of Skinner State Park. Skinner State Park consists of over 400 acres of forest on Mount Holyoke at the western edge of the Holyoke Range. There are numerous hiking trails accessible at all times of year. It includes the summit of Mount Holyoke and the Summit



Figure 35: Mount Skinner Historic Hotel. Hadley Historical Society.

House, providing spectacular views of the Connecticut River valley, and is a tourist destination. The agricultural lands in this district have undergone modest changes over time; many of the original farms are still working today (Hockanum Historic District 2014).

North Hadley Historic District – recognized by the National Register of Historic Places, the village of North Hadley is roughly located between the Connecticut River and Mount Warner, including property on River Drive (Route 47) between Stockwell Road and Stockbridge Street. The North Hadley Historic District also includes property on French, Meadow, and Mt Warner Streets. The majority of properties in the district are agricultural and residential. Other notables in this historic district include Congregational Church (c. 1834), the 1975 cemetery, and the North Hadley Hall, a 1686 structure built originally for a schoolhouse. North Hadley developed as a mill town, around the dam built on Lake Warner. The grist mill was erected circa 1670, before which residents had to travel north to Hatfield to utilize the grist mill there (North Hadley Historic District 2014).



Figure 34: Hockanum Historic District. Hadley Historic Society.

Porter-Phelps-Huntington House – recognized by the National Register of Historic Places, the Porter-Phelps-Huntington House is located at 130 River Drive (Route 47) and is a historic house and museum. It contains the collection of one extended family, with objects dating from the 17th to 20th centuries. The house was occupied from 1752 until the 1940's when an eighth generation of the family turned it into a museum. The name of the museum derives from the unusual fact that for the first three generations, the house passed through the female line of the family, from a Porter to a Phelps to a Huntington (The House, Porter-Phelps-Huntington House 2014).



Figure 36: The Porter- Phelps-Huntington House Museum. Porter-Phelps-Huntington Museum Archives.

For this project only the three main historical districts have been identified (Hadley Center, Hockanum, and North Hadley), but there are other historical areas within the town of Hadley, as well as numerous historical homes, farms, buildings and other structures. Not all original historic features are still standing, and Hadley has erected markers to denote the former locations of some of these historical assets. The Massachusetts Historic Commission (MHC) was established in 1963 (MGL Ch. 9 Sections 27-32 enabling legislation) to identify, evaluate and protect important historic and archeological assets of the Commonwealth. The professional staff involved with the Commission includes historians, architects, archeologists, geographers, and preservation planners. The state's preservation programs are administered through MHC's Preservation Planning, Grants, and Technical Services Divisions. Under the maintenance of the MHC is the Massachusetts Cultural Resource Information System (MACRIS). MACRIS data are compiled from a variety of files and records of MHC, including but not limited to, the Inventory of Historical Assets of the Commonwealth, National Register of Historic Places nominations, State Register of Historic Place listings, and local historic district study report. Inventory points may be buildings, burial grounds, structures, and objects (e.g. statues, monuments, walls, etc.) (Massachusetts Historic Commission 1982).

CHAPTER 5. EDUCATION

Hadley itself does not give home to any of the higher educational institutions in the area; however, the rail trail, running east-west, helps serve as a transportation connection between Smith College in Northampton and Amherst College, Hampshire College, and the University of Massachusetts in Amherst. The Five College Consortium (including Mount Holyoke College in South Hadley) promotes broad educational and cultural objectives shared by all the members. The cooperation between each institution includes cooperative use of educational resources and facilities, including joint library system, open cross registration, and inter-campus transportation (The Consortium 2014).

Hadley is located in New England's Knowledge Corridor. This area has been identified as an interstate partnership of educational institutions, regional economic development, planning, business, and tourism. The Knowledge Corridor works to advance the region's economic progress, emphasizing the region's rich history of innovation, invention and educational assets. Beginning as an initiative between Springfield, MA and Hartford, CT the Knowledge Corridor now stretches from New Haven, CT through Springfield and Hartford up to Greenfield, MA. Hadley is part of this growing institution that includes Interstate 91 corridor, the Connecticut River, workforce and economic diversity, and higher education institutions (New England's Knowledge Corridor 2014).

Educational Resources

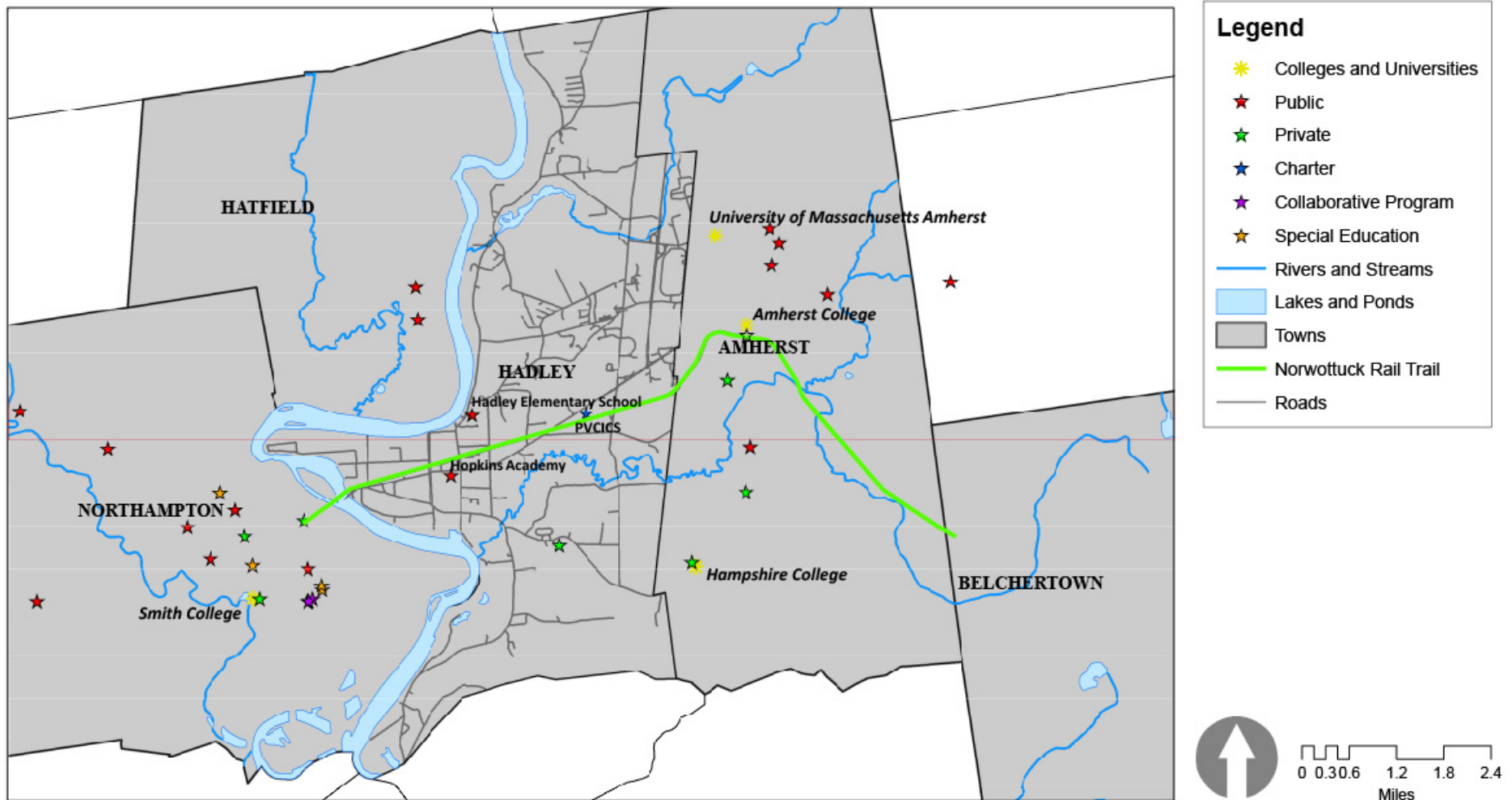


Figure 37: Educational Resources. Colleges, private, public and charter schools in the area.

Hadley provides home to Hopkins Academy. Hopkins Academy is now a public middle school (7-8) and senior (9-12) high school for the town. It is the fourth oldest high school in the US that is still in operation. It was founded in 1664 with an endowment from a wealthy Connecticut merchant, Edward Hopkins. Its original purpose as a private school for boys was to prepare them for university while training them for the ministry and for teaching. It is currently located at 131 Russell Street. The Academy has evolved into a coeducational public school preparing students for college and for life (Dwyer 2014). Hopkins Academy has recreational sporting fields to support the school's sporting teams.

Hadley Elementary is located at 21 River Drive, a few miles north of Hadley town center. As the town's only public elementary school, it provides education for ages Pre-K through grade six. The school offers high quality educational opportunities for diverse student learners to achieve their individual potential. The school promotes health and wellness through their Wellness Policy. This plan sets out guidelines for healthy eating choices while at school or during school functions, as well as guidelines to provide students with skills to foster a physically active lifestyle (Hadley Public Schools 2014). Hadley Elementary School grounds include a playground.

Alongside the public school system in Hadley is an assortment of other private and charter school that add to the diversity of education in the area. A few of these within close proximity of this project site are:

- Whole Children – located at 41 Russell Street, Whole Children programs and classes for children from toddler through teens with a range of abilities. Founded by parents of children with special needs, the goal of the programs is to meet each child at their skill level. Whole Children provides recreational, social, and enrichment programs for children and teens of all abilities, including those with special needs (WholeChildren 2014).
- Pioneer Valley Chinese Immersion Charter School (PVCICS) – located at 317 Russell Street, PVCICS prepares Kindergarten through 12th grade students for academic and personal success through rigorous study and instruction. Aligning study with state and federal standards, course work is augmented with Chinese language and culture. PVCICS opened in 2007 as a tuition-free regional public school and currently enrolls almost 400 students from nearly 30 communities in the Pioneer Valley (PVCICS 2014).

Open Space and Recreation

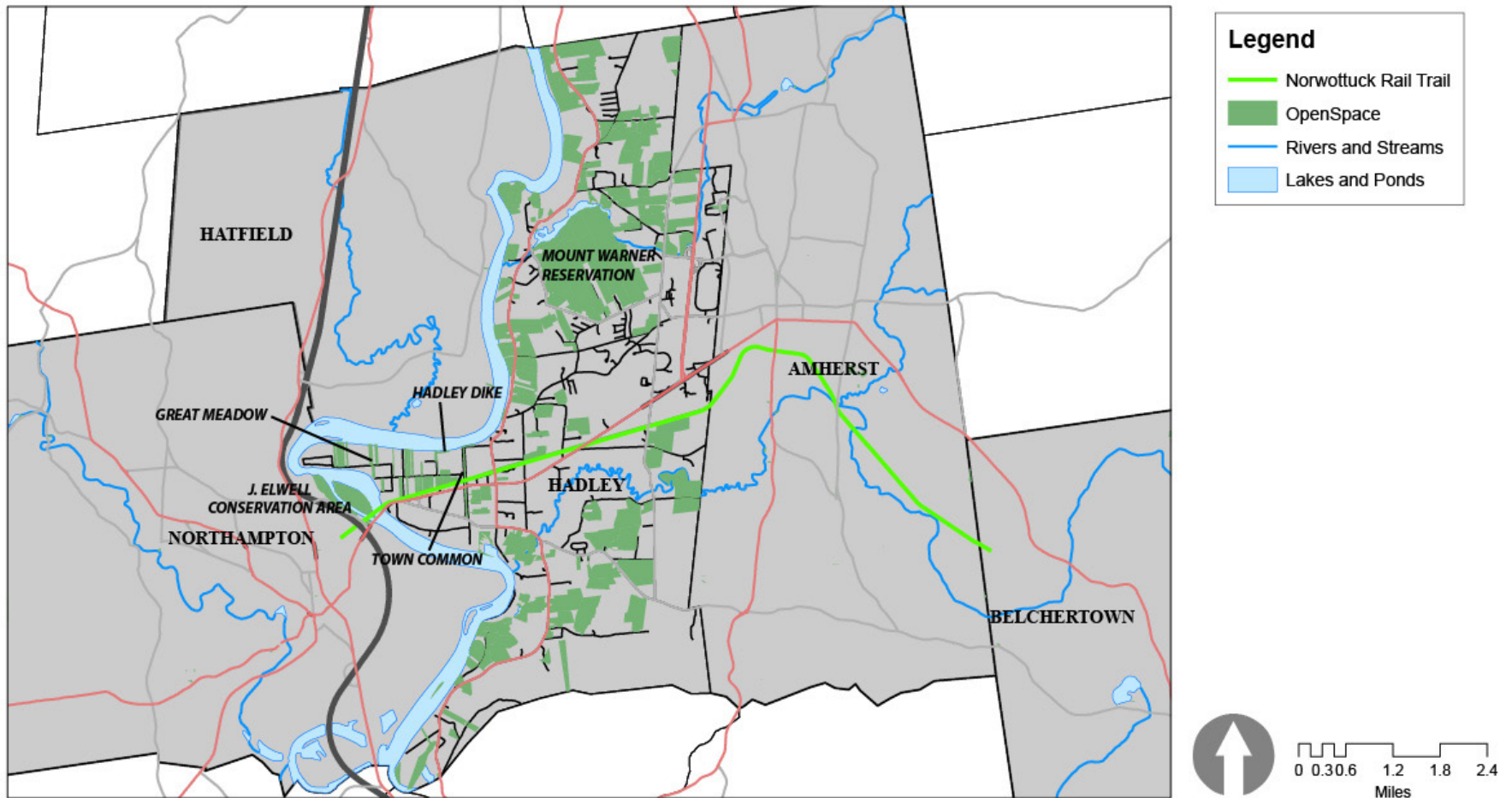


Figure 38: Open Space and Recreation in Hadley.

The Norwottuck Rail Trail is defined as a linear greenway by the DCR. While it is maintained and monitored as a linear corridor, Hadley has numerous other beneficial open spaces and recreational opportunities within accessible distance to the rail trail. Some of these will be incorporated into this project through proposed connecting circuits and linear corridors. Hadley has a long history of preserving open space. The 2005 Hadley Master Plan states that as of 1999, approximately 85% of the town was open land, with 77% being underdeveloped crop or forest. A total of 41% of Hadley's total land is protected by preservation programs such as Agricultural Preservation Restrictions (APR) and Conservation Restrictions (CR). The primary purpose of Massachusetts's APR program is to preserve and protect agricultural land, including prime farmland, from being built up as non-agricultural related land uses or any other use that does not support the land's agricultural use and potential. Much of the farmland in the Great Meadow of Hadley and land along the rail trail is protected, preserving a long history of farming. Farmland not only contributes to the scenic beauty of the town, but provides for clean air and water, wildlife habitat and recreational opportunities (Energy and Environmental Affairs 2014). Conservation Restrictions occur when a landowner conveys a partial interest of land to a qualified conservation organization or public agency. By doing this, the landowner agrees to limit future development and use of the land in order to preserve identified conservation values. These are certain features or qualities of the property that are to be protected, such as wildlife habitat, scenic views, agricultural land, or watershed protection (MassAudubon 2014).

The 2.2 mile section of the rail trail in this project has the stunning Connecticut River as one of its environmental assets. While crossing the trestle bridge, there are wonderful views up and down the river. Kayakers, rowers, and boaters take advantage of the dock and water access from the parking lot at Damon road. Wildlife, such as herons, is often seen feeding along the shore. Travelling along the rail trail there are views to the south of the Holyoke Range, and north into the existing farm fields – fields that have been tilled and cultivated since the first settlers came to Hadley. Some of these farm fields are frequented by bird enthusiasts. The area of Honey Pot Road is a rich flood plain frequented by species such as horned lark and snow bunting flocks during the winter months (Spector 2014).

Recreational lands such as at Hopkins Academy, school playgrounds such as at Hadley Elementary, and the Norwottuck Rail Trail are a few examples of other preserved open space the town currently has as assets. Despite the abundance of open space, the town's master plan addresses the weakness with regard to connections between such open spaces. This disjointed formation of open space inhibits use, recreational potential, and habitat viability within the town (Hadley Master Plan 2005).

J Elwell Conservation Area:

The entire island of the J Elwell Conservation Area in the Connecticut River is part of the Connecticut Greenway State Park. The island is approximately 60 acres, with an additional 40 acres of riverfront land on the west side of the river adjacent to Damon Road. The Elwell family owned the property for a century and a half before the town purchased as a conservation area in 1981. It is the second largest conservation area identified by the Northampton Conservation Commission.

An open meadow covers nearly half the island; from the 1830's through 1940's the Elwells managed this section of the property as a cattle pasture and hay field. Since then the only management has been natural flooding and brush fire. The area is home to various animals, mostly seasonal due to annual flooding, including groundhog, deer, fox, muskrat, as well as numerous song birds (Sanders 1999). The eastern edge of the island provides an excellent beach and is used heavily by boaters, as this is the only access to the island (Open Space, Recreation & Multi-Use Trail Plan 2010).

The remaining 35-40 acres of the Elwell Conservation Area are located on the mainland between Damon Road and the river. Beginning a few hundred yards upriver from the Norwottuck Rail Trail Bridge, this section runs for about a mile and is part cornfield and part floodplain forest. A local farmer, in accordance with a Farm Use License, uses a little less than half of the land on the mainland (Open Space, Recreation & Multi-use Trail Plan 2010). This area is accessed by the farmhouse road behind the funeral parlor on Damon Road or by footpaths behind River Run Apartments. The trails are not maintained by any town or state entity (Sanders 1999)

Hadley dike:

The Hadley dike was built in 1928 to prevent flooding on the Connecticut River. It protects several historic buildings in Hadley, the town common, and Old Hadley Cemetery, all of which are part of the Hadley Center Historic District. The Hadley dike is a popular spot along the river for walkers. There is parking for a few cars at the end of the town common on West Street at the Alexandra Dawson Conservation Area. From West Street to the intersection of the Norwottuck Rail Trail at Cross Path Road via the Hadley



Figure 39: J Elwell Area. Entrance at Damon Road in Northampton. Photo: Rebekah DeCoursey



Figure 40: The Hadley Walkway, Riverscaping Project. Photo by Hampshire Daily Gazette.

dike is approximately a mile. While the dike is an excellent flat trail for walking, the elevated height of the dike is disconnected from anyone passing by at road level. The views and the beauty of the river are lost behind the dike and best seen when standing on top of the earth structure.

As an effort to reconnect the community to the river, a competition was held by RiverScaping for a project site on North Lane, near the town common and the dike. RiverScaping is part of a region-wide campaign to explore how the river shapes and connects communities in the region, with three other project sites in Springfield, Holyoke, and Turners Falls. It also has a partnership between Five Colleges Inc. and people in Hamburg, Germany. A project designed by Laura Brooks of East Lyme, Connecticut was picked at the winner during Brooks' junior year at the University of Massachusetts. Her design involved a series of wooden platforms 30 inches above the ground; another portion raised several more inches so shorter persons could see the river as well. The Hadley Walkway, as she called her submission, was about 30 feet long and 18 feet wide. Cut outs in the walls gave people different perspectives of the river than would have simply passing by the site at street or sidewalk level (Merzbach 2013). This was a temporary public art installation and removed in 2014.

Hadley Town Common:

The Hadley town common runs through the center of Hadley, along the entire length of West Street. It is the longest town common in Massachusetts. The town common was laid out when the town was first settled at a bend in the Connecticut River, the large open area stretching with the river bordering each end. At one time, each end of the town common provided a ferry across the river. To this day, there are strict use regulations to maintain the aesthetic form of the historic town common.



Figure 41: Hadley Dike. Photo: Rebekah DeCoursey.



Figure 42: Hadley Town Common. Town of Hadley photo.

Connecticut River:

As the western edge of the town border, the Connecticut River is a beautiful asset, providing numerous recreational activities to both residents and visitors. There are beaches and rope swings, boating opportunities, as well as fishing and wildlife viewing. Annual flooding of the river helps provide necessary nutrients to the adjacent agricultural fields of the Great Meadow.

Lake Warner and Mount Warner:

The Trustees of Reservations has been working to revitalize the old cart paths throughout Mount Warner, giving access to the old logging roads running through the beautiful forests, vernal pools, and seasonal wetlands. Trail signage had been provided after years of under use of the area (Trustees 2014). The Mount Warner Reservation is located in North Hadley. Surrounded by working farms, Lake Warner provides a boat launch for large and small boaters. A perfect spot for fishing and wildlife viewing, this area is popular with locals and visitors due to its ease of access.



Figure 43: Mount Warner Reservation. WAMC photo.

CHAPTER 7: CURRENT CONDITIONS

The focus of this project is a 2.2 mile section of the rail trail, starting on the Damon Road parking lot in Northampton, and running through Hadley to the intersection with East Street. There are four road crossings: Cross Path Road, West Street, Middle Street, and finally East Street. There are two parking areas, a large one at Damon Road that serves as the main access to the rail trail, and newer parking spaces along Railroad Street that were completed with the rehabilitation project, including several handicap accessible spaces adjacent to the trail. The project passes through agricultural farm fields and areas of residential housing. It goes through a historic district in town, past several historic markers, and also passes through commercial areas. Residents abutting the rail trail include single family homes as well as elderly housing and affordable housing. The diversity of land use and residents in this section of trail combined with the historic significance creates a unique opportunity for enhancing the rail trail.

7.1 Land Use

Land Use (2005)

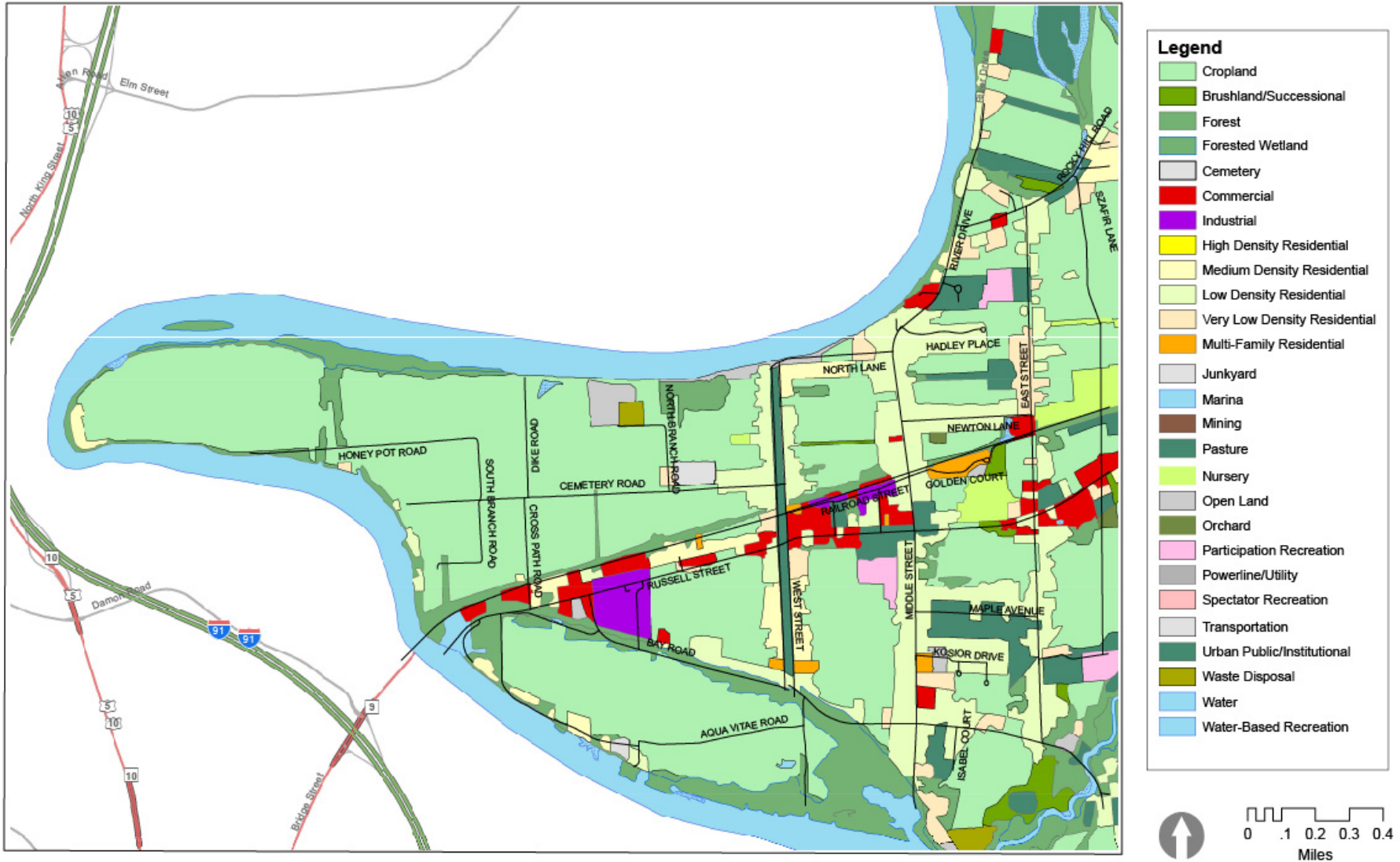


Figure 44: Land Use Conditions

7.2 Hydrology

The close proximity to the Connecticut River is not only a historic part of this section of Hadley, but of vital importance to the fertility of the farmland in the Great Meadow that had been used as agricultural fields for centuries. The Hadley dike protects the historic Hadley Cemetery and the historic town common from seasonal flooding of the river. This dike also separates and creates the difference between the 100 year floodplain in this area of town from the 500 year floodplain. Other than the Connecticut River and its threat of flooding, the only other hydrological features along this project is a small pond and wetland area at the far east section of the project site, as the trail approaches East Street. Currently, this small pond is sectioned off from the rail trail by a black chain linked fence. The area and fence are overgrown with invasive species such as bittersweet and Japanese knotweed. Animals and birds use the area as a water hole, including ducks, but from the trail is it hard to view unless one all but fully stops to carefully peer through the overgrown fence.



Photos by Rebekah DeCoursey

Figure 45: Hydrology along the Norwottuck Rail Trail. Existing stream and pond is to the right of the trail.



Figure 46: Current conditions and existing fence between the rail trail and a small stream and pond.



Figure 47: Existing stream and pond currently lacks visual connection to the rail trail. Over grown vegetation and a tall chain link fence create a barrier from this environmental asset.

Hydrology

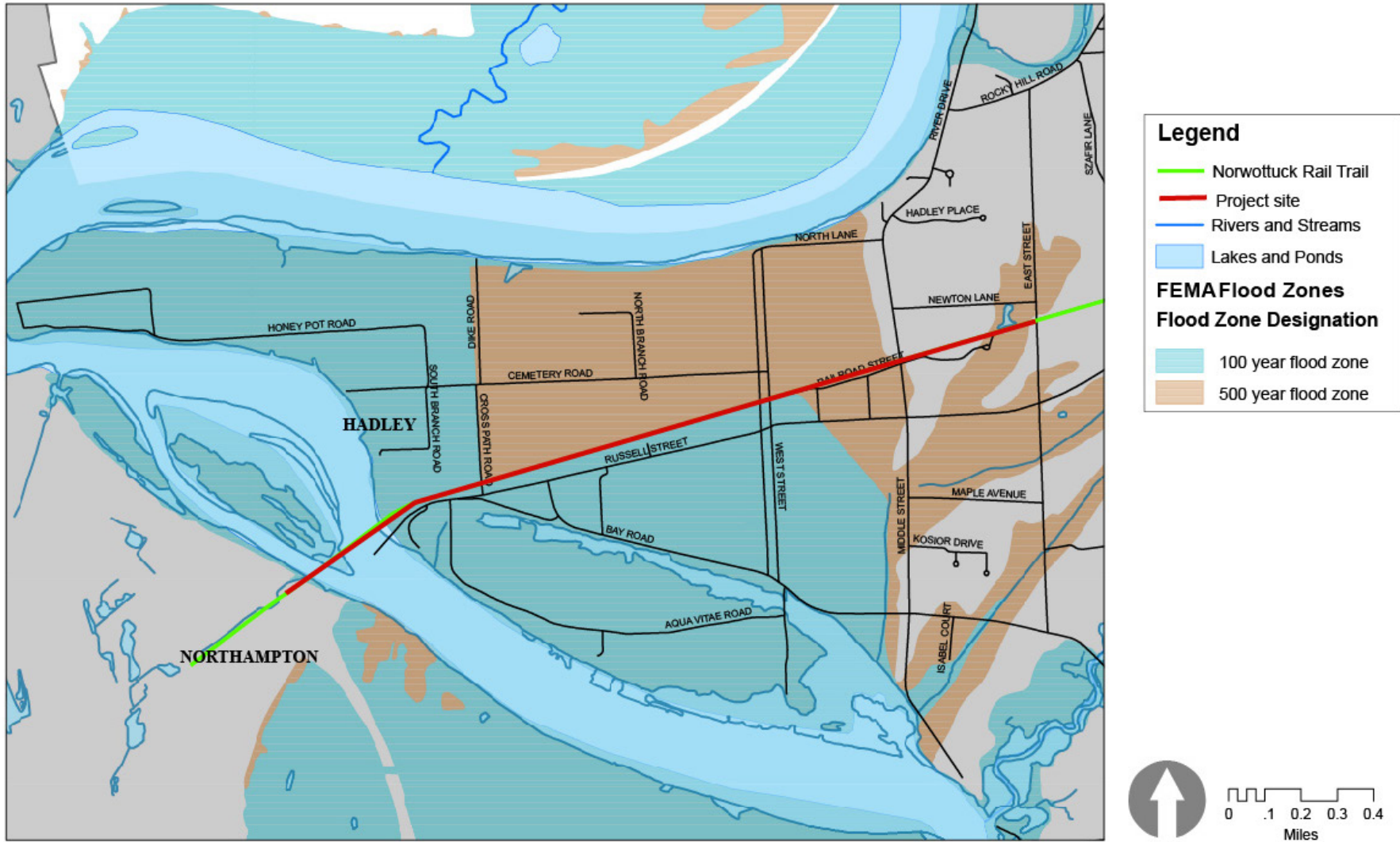
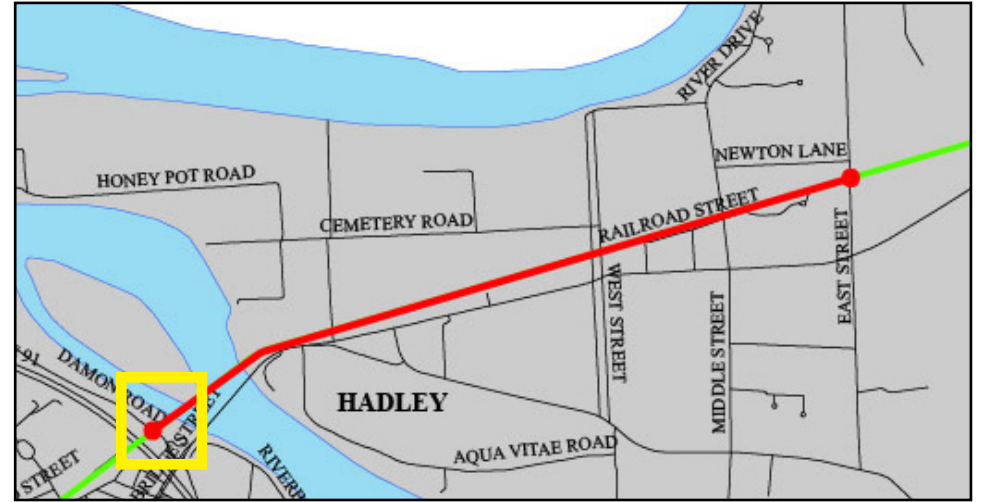


Figure 48: Hydrology. The Connecticut River and surrounding floodplains are the main hydrological assets of the trail, along with a small stream and pond in the east portion of the project site.

CHAPTER 8: PROJECT SITE

Case studies show that rail trails that travel through a variety of land uses are very popular. Rail trails that feature a variety of land uses along their routes appeal to their many users for different reasons. As scenery changes and users move along on the trail, focus and interest, though different for each individual, is universally enhanced. The Norwottuck Rail Trail can easily take advantage of the opportunity to expand amenities and structure based on its unique components and clientele.

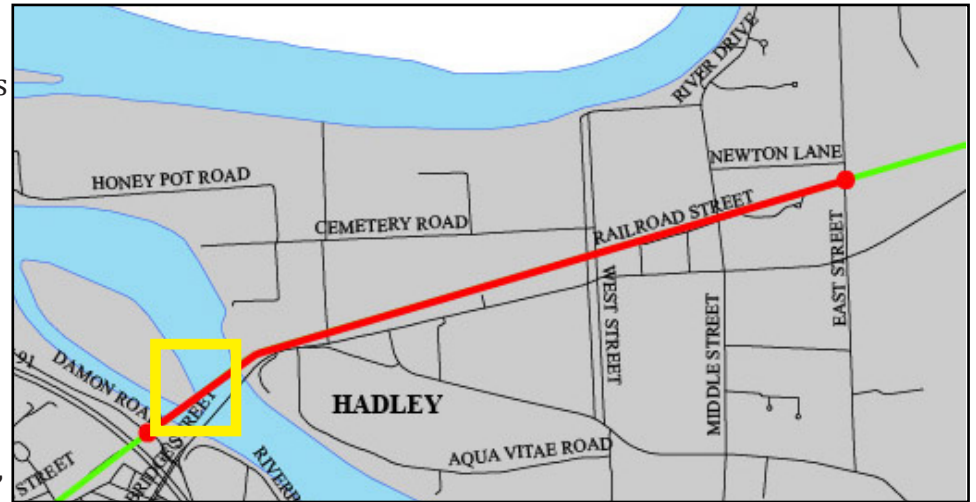


Damon Road is the main parking area for the Norwottuck Rail Trail at the Elwell Recreation Area. At this location there are handicap parking spaces and traditional parking. There is also access to the boat launch on the Connecticut River. Located conveniently at the corner of Russell Street (Route 9) and Damon Road, the parking lot here has restrooms (open seasonally), picnic tables, and an informational kiosk. This parking lot was updated in the rehabilitation work of the rail trail. Parking improvements included adding additional spaces and parking for handicapped users. Trail signage was updated, as well as improved picnic tables, pathways, and vegetative plantings. At this spot users can access the Norwottuck Rail Trail on the Lattice Truss Bridge.

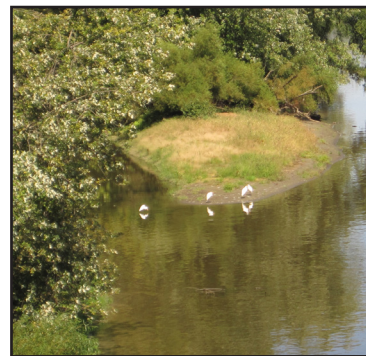


Figures 49 - 53. Damon Road parking lot, handicap accessible, picnic tables, signage and kiosks, and access to the Lattice Truss Bridge.
Photos by Rebekah DeCourcey

After leaving the Damon Road parking lot, the rail trail crosses the historic **Lattice Truss Bridge**. The bridge provides beautiful views of the Connecticut River. From this point users have a view south of the Holyoke Mountain Range as well as viewing any animals or other people using the river. To the north many animals include local bird populations, muskrat and other small animals, many seen on Elwell Island or on the shore of the river. Where the bridge crosses over Elwell Island, although there is no access to the island from the bridge, crossing over this landmass midway through the bridge provides polite interruption from the waterway and gives protected shade from the island trees.

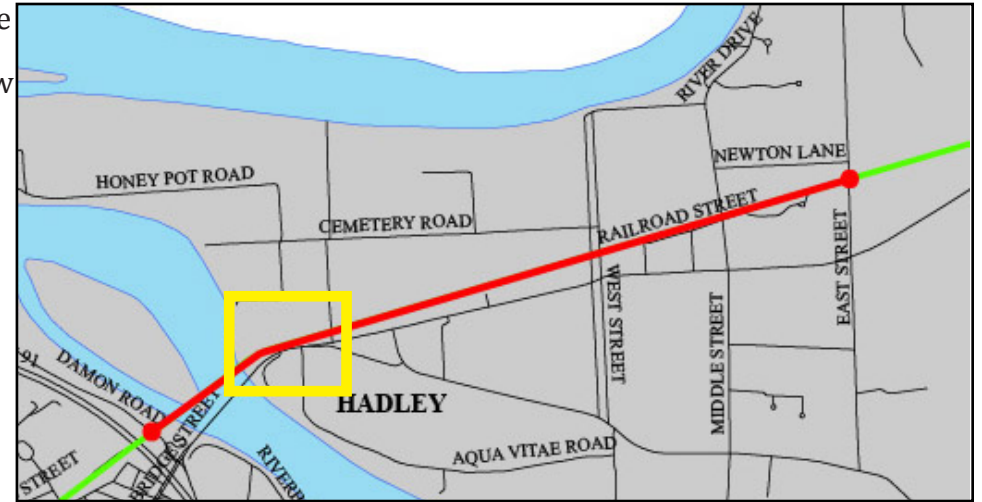


There is a boat launch at Damon Road, allowing access to the water for rowers, kayakers and canoers. Swimming is not typically recommended at this point on the river, as there are numerous power boats that use the marina just south of the bridge. Boaters are allowed to venture to Elwell Island by water and enjoy the beaches the island has to offer, as well as explore, but the island is covered with many invasive species including poison ivy and dense vines of bittersweet and wild grape.



Figures 54-58. Northampton Lattice Truss Bridge. Views north and south, as well as of wildlife and dock access to the river from Damon Road parking lot. Photos by Rebekah DeCoursey

At the intersection of **Cross Path Road**, the rail trail crosses the Hadley dike. At this point rail trail users have the opportunity to follow the dike north to the Connecticut River. It is a connection that is best for people walking or riding off road bicycles; it is not maintained for road bicycles. The dike can be followed for several miles with striking views of agricultural fields and the river. It is a popular place for dog walkers.

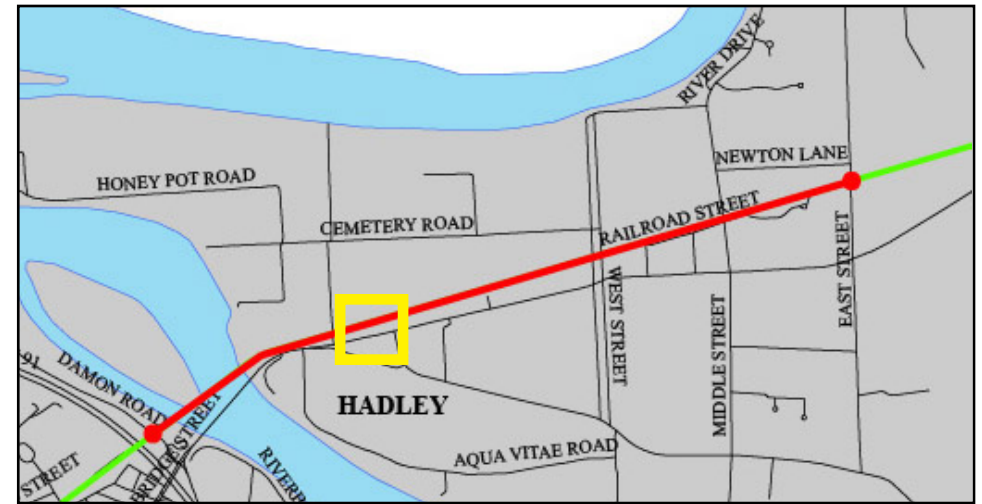


Cross Path Road helps marks the change in township from Northampton to Hadley; motorists travelling east along Russell Street are welcomed to Hadley by a sign on the north side of the road near Cross Path Road. Two large weeping willow trees stand here between the rail trail and Russell Street, and a catch up area with bench are located on the rail trail. This plot of land is owned by the town. Cross Path Road is often used as a short cut by commuters and the rail trail is visible from Russell Street at this point. The view north here shows users the historic Great Meadow of Hadley, with the large farm field stretching almost out of eyesight filled with different crops and colors as the seasons change.



Figures 59-63. Intersection of Cross Path Road. Rest area with bench, access to the Hadley dike, and views into the Great Meadow.
Photos by Rebekah DeCoursey

The south side of the rail trail primarily abuts **Residential** land from Cross Path Road to the car dealership, with a few other commercial lots mixed in as well. The north side of the trail is mainly protected agriculture or conservation land and will continue to remain the same in perpetuity, preserving the historic use and beauty of the Great Meadow. One remaining historic feature of the rail trail is whistle posts, as seen in Figures 64 and 68. Whistle posts were used during the days of rail use to signal a conductor that they were nearing a road crossing and needed to blow the train whistle to alert those on the road ahead of the nearing train. These strong granite structures marked with a “W” have remained in place through the test of time.

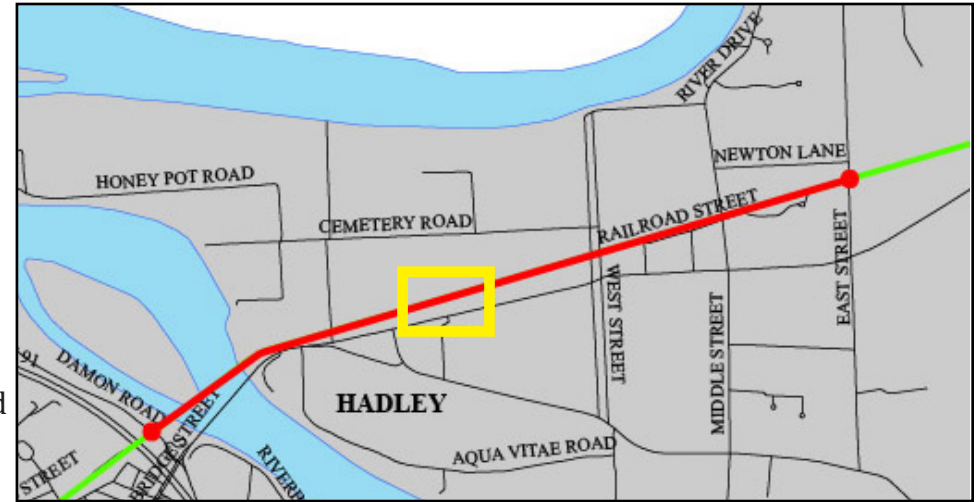


Most residential homes in this area from Cross Path Road to the dealership have their backyards directly abutting the trail. All are located on the south side of the trail, and some have chosen to plant the embankment with ornamental vegetation, others chose to mow, or to keep it more natural. There are no homes that have installed large fences or blockades to keep people from entering their yards, the steepness of the embankment has served as enough of a deterrent to keep any known vandalism from occurring.



Figures: 64-68. Residential property abuts the rail trail to the south. Some backyards have vegetative plantings, others are not as manicured and more natural. To the north between groups of trees there are views into agricultural fields. Photos by Rebekah DeCoursey

In the section after the abutting residential land and the Country Nissan **Dealership** the land to the north remains agricultural land. This section abutting the car dealership is mostly buffered to the south by trees and shrubs. The dealership sponsors an air and water fill station next to the trail at a catch up area. This catch up area also includes a bike rack and bench in a shaded spot welcoming users to stop and rest. This is an excellent example of a positive interaction and relationship between the local businesses and rail trail users.



At this point on Russell Street, there is a traffic light and a crosswalk, allowing people to access the businesses on the other side of the road and the connection to Bay Road. Users have created an informal path through the parking lot of the dealership to obtain access to the crosswalk. The Mi Tierra restaurant and International Food Market are also in this stretch of the rail trail. Informal connections behind the businesses allow access the businesses and other Route 9 destinations directly from the rail trail. Much of the growth along the side of the trail is overgrown with aggressive vines such as bittersweet and grape.



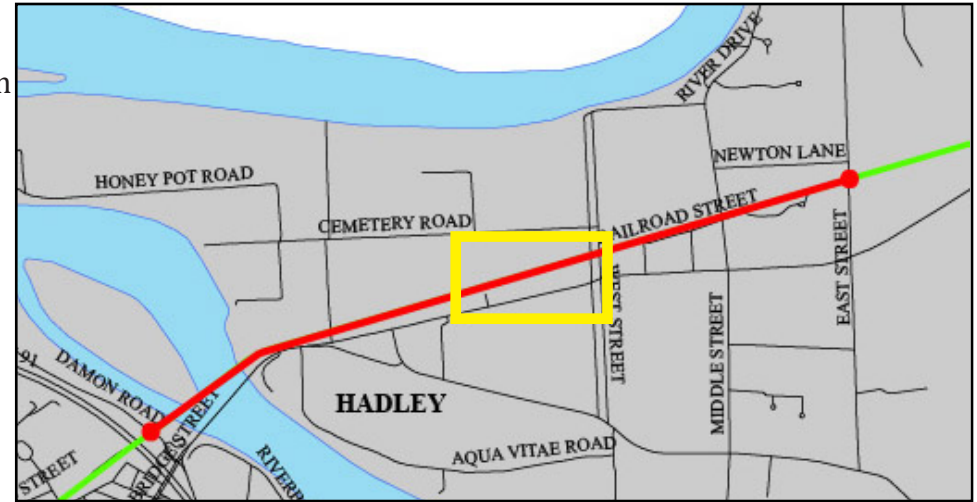
Figures 69-73. From Cross Path Road to the Country Nissan dealership, north of the trail is agricultural land. At the Dealership there is a rest station with water and air. Behind two business at this point in the trail there are human made paths connecting to the businesses. Photos by Rebekah DeCourcy

Between the dealership and West Street, starting from the informal connection to the Mi Tierra Restaraunt, there is a long section of **Agricultural** land. Most of this section is enclosed and shaded, but there are some places where the vegetation opens, allowing a user to view into the fields.

Nearing **West Street** and crossing the town common there are more residential homes; many of these built when the town common was originally formed. The town common in Hadley, being of historic significance, has strict regulations for use and change. The town strives

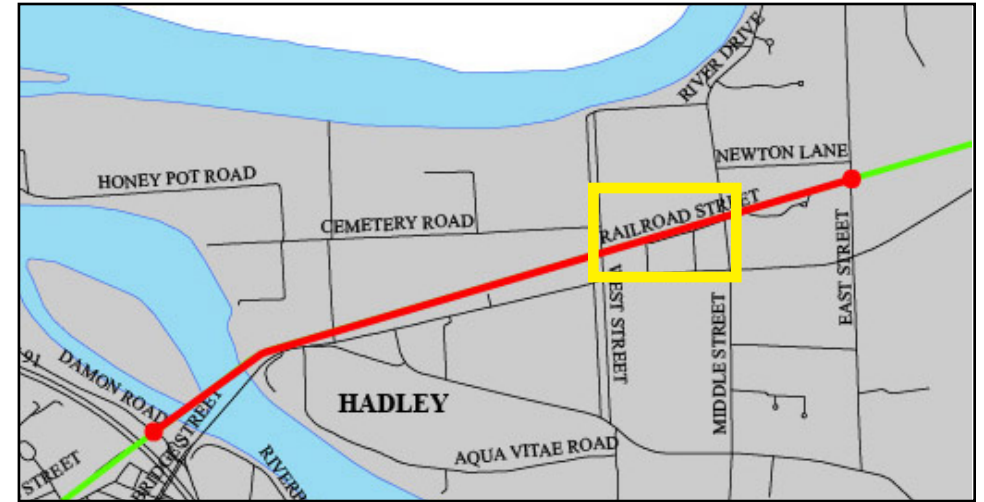
to keep the large open space, lined with two rows of trees bordering on each side, as it has been for centuries. The rehabilitation project created a catch up area on each side of the town common. At the northernmost end of the common, there is a small parking area next to the Hadley dike, at the Alexandra Dawson Conservation Area.

Railroad Street closely parallels the rail trail between West Street and Middle Street; this section of trail that continues to Middle Street is primary commercial and industrial land use, with a few residential homes mixed in. Railroad Street provides universally accessible parking spaces to access the trail, an area which has been named “Hadley Depot” by the rehabilitation project. There are a variety of commercial land uses along Railroad Street including an arcade bar that serves food, a tattoo parlor, as well as several automotive services.



Figures 74-78. Passing over the town common at West Street, the rail trail turns into Hadley Depot. Here there is additional parking, benches, and picnic tables. The trail also abuts commercial pieces of land that include trailside arcade bar with food. Photos by Rebekah DeCoursey

The Railroad Street **Hadley Depot** offers a rich opportunity as a destination and gateway to the trail. There are historic buildings, parking spaces, and picnic tables. New and old businesses in this area are succeeding. The area is used by All Out Adventures for their weekly cycling program in the summer, providing bicycles to accommodate a large range of users including tricycles, tandem cycles, and hand-pedal cycles.



Moving across Middle Street, the land to the north continues as agricultural, where an **Orchard** will be proposed in this project.

On the south side, there are complexes of multi-family homes on Golden Court and Burke Way, one area of elderly housing and another of affordable housing. These complexes are separated from the trail by a large eight foot fence, with mainly invasive trees and shrubs occupying the space between the fence and the rail trail. This fence impedes backyard access to the rail trail for residents living there, but also provides privacy to the residents of the homes. The north side of the trail is all agriculture providing great views into the farm fields, of Mount Warner, and the Berkshire mountains. Moving into the final section towards **East Street**, nursery land emerges past the fence, opening up views to the south. This is the area of that includes a small pond next to a large old building used for various commercial establishments, including a printing business, artist studios, and East Street Ballet. A large water tower is located here, marking the end of the project site.



Figures 79-83. Moving towards Middle Street, the rail trail becomes separated from housing on the southern side by a large fence. This is the only section of the trail with potential to interact with the hydrology. To the north is agricultural land. Photos by Rebekah DeCoursey

CHAPTER 9. CIRCULATION

This section of the project proposes several circuits that exit and then loop back to the rail trail. The large variety of trail users presents the opportunity to provide destination points and circuits to accommodate the needs of many. This project will identify six different user groups: short distance walkers, long distance walkers, active bicyclist routes, commuter routes, educational history circuit, and fitness center connections.

9.1 Short Distance Walking

Many users access the rail trail at lunch time or end of the day for outside exercise. These walkers do not necessarily use the trail for extended travel, but rather in shorter quarter-mile to mile long increments. A distance of two miles can provide around 30 to 45 minutes of cardio exercise a day, which is recommended for general cardio health and physical fitness. This group of users typically tends to only use the rail trail for short walking distance, an easy in and out path to and from their car at Damon Road. The following are distances based from the starting point of the end of the bridge at the Damon Road parking lot.

- Cross Path Road: 0.6 miles with proposed seating patio and viewshed including public art
- Country Nissan Dealership with proposed connection to Russell Street and Bay Road: 0.8 miles
- Catch up area near Elmwood Court: 1 mile. Existing catch up area with proposed plantings
- Town common: 1.4 miles. Existing catch up area with proposed plantings

These proposed distances – considering the distance is doubled with the in and out following the rail trail – and in regard to recommended daily physical fitness levels, would be enough to raise the heartrate of an average person walking at a brisk pace. Benches placed at each catch up along the rail trail provide a place to sit and rest for those that need it, such as elderly or children. They also provide a place for relaxation and meditation. In this category these suggested walking distances are for the casual walker, those on a quick lunch

break, dog walk, outing with a child, or a starting distance for those working to increase their physical fitness.

Along the short distance walking circuit, there are seven points of interest that will be highlighted along the rail trail. These highlight points are notable historic features, environmental assets, catch up areas or connection points for the users. Starting at Damon Road, the points are in order traveling east on the trail:

- Lattice Truss Bridge. Historic architectural piece of the Norwottuck Rail Trail. Where the bridge crosses the Connecticut River it provides stunning views of the river and of the Holyoke Range.
- Whistle Post. Historic part of the old rail line, these granite posts were located at a specific distance from each road crossing, alerting the conductor to blow the whistle to warn traffic of the incoming train. Many of these whistle posts have survived the test of time and still remain untouched along the side of the trail.
- Cross Path Road. The user is .6 miles from Damon Road. This area will be a proposed destination point with viewing platform looking out onto the historic Great Meadow and agricultural fields. At the point the user also has the option to follow the Hadley Dike through the Great Meadow and connect with the Connecticut River at the north apex of the dike.
- Country Nissan Dealership. At .8 miles, there is a rest stop with bench, as well as water and air provided by the dealership. Here is also a proposed connection to Bay Road, where currently a traffic light provides a cross walk connecting to the south side of Russell Street.
- Connection to local businesses. At this point the rail trail passes behind Mi Tierra Restaurant and the International Food Market. Users have easy access from the rail trail to an easy meal or shopping.
- Viewpoint. An opening in the foliage here provides view of the agricultural fields of the Great Meadow, the Berkshire Mountains to the west, and Mount Warner to the east. The catch up area here is one mile from Damon Road.
- Town Common. The historic town common has many historic buildings, as well as the common protected open space. It is 1.4 miles from Damon Road. There are numerous benches on the common for resting, as well as close proximity to various eateries and shops.

Circulation: Short Distance Walking



Legend

- | | | |
|-----------------------|------------------------|--------------------|
| Structures | Limited Access Highway | Wetland |
| Norwottuck Rail Trail | Numbered Highway | Rivers and Streams |
| Protected Open Space | Major Road | |
| Points of Interest | Arterial Street | |



0 0.1 0.2 0.4 0.6 Miles

April 14, 2015
Data Source: MassGIS

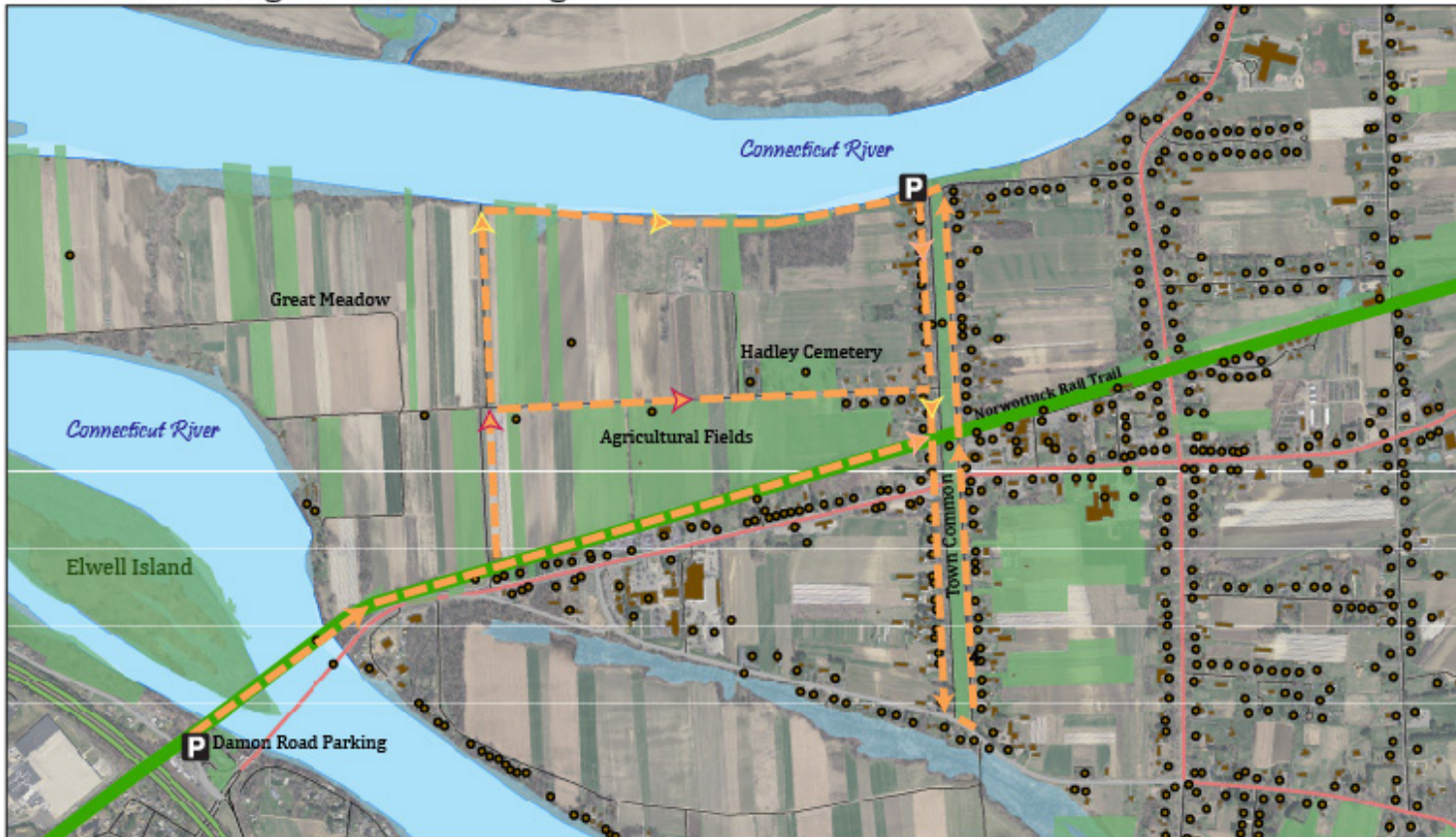
Figure 84: Short Distance Walking Circuit. This circuit is a proposed 1.4 mile stretch of the rail trail with existing and proposed points of interest along the way. Spacing of these points at various intervals provides different length destination points for a variety of users.

9.2 Long Distance Walking

As a linear greenway, the rail trail provides a safe long distance area for recreational users of all sorts. This category of distance walkers focuses on proposed circuits that take longer routes than short distance walkers. Exiting off the main rail trail at several proposed points, long distance walkers would be able to extend their walking distance and period of time for exercise. Some of these users are out walking their energetic dogs, some may be looking for a change of scenery off the rail trail, and others working to increase their physical fitness can take these longer circuits for their exercise routine. Proposed circuits in this category are measured starting from the bridge at the parking lot at Damon Road.

- Exiting the rail trail at Cross Path Road and following the Hadley dike to Cemetery Road, following Cemetery Road to the town common and back south to the rail trail, taking it back to Damon Road: 3.2 miles
- Exiting the rail trail at Cross Path Road, following the Hadley dike, past Cemetery Road to the Connecticut River and continuing east along the dike to the town common, looping south back to the rail trail and following it back to Damon Road: 3.6 miles
- From Damon Road, following the rail trail straight to the town common and following West Street to travel around the common either north or south (equal distance) and then take the trail rail back to Damon Road: 4.6 miles

Circulation: Long Distance Walking



Legend

- | | | |
|-----------------------|------------------------|--|
| Norwottuck Rail Trail | Limited Access Highway | Wetland |
| Protected Open Space | Numbered Highway | Rivers and Streams |
| Historic Points | Major Road | Proposed 4.6 miles Long Distance Walking Circuit |
| Structures | Arterial Street | Proposed 3.6 miles Long Distance Walking Circuit |
| Parking Access Points | | Proposed 3.2 miles Long Distance Walking Circuit |



0 0.1 0.2 0.4 0.6 Miles

April 1, 2015
Data Source: MassGIS

Figure 85: Long Distance Walking Circuit. Three proposed loops provide varying degrees of distance. All leaving from Damon Road, the longest circuit at 4.6 miles goes straight to the town common, circling around the perimeter and following the rail trail back to Damon Road. The middle distance circuit exits the trail at Cross Path Road, following the Hadley dike north to the Connecticut River and then east along the river to the town common. Turning south, this circuit meets back at the rail trail and back to Damon Road after 3.6 miles. The final shortest circuit, 3.2 miles, also exits the trail at Cross Path

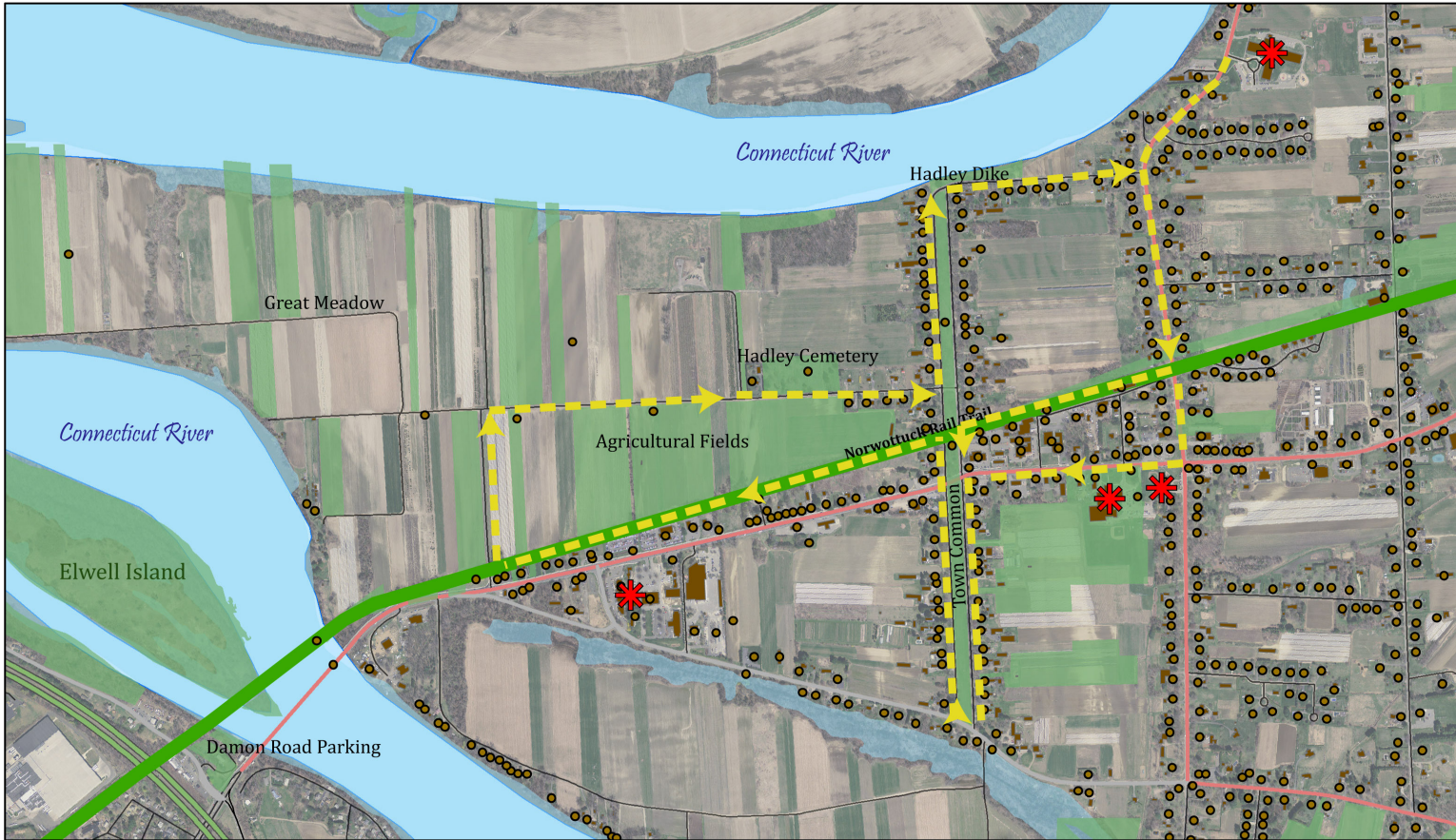
Road, and follows the dike to Cemetery Road, passing through the agricultural fields and by the Old Hadley Cemetery. Turning south at the town common, the route meets back up with the rail trail and users can take the trail back to Damon Road parking lot.

9.3 Educational History

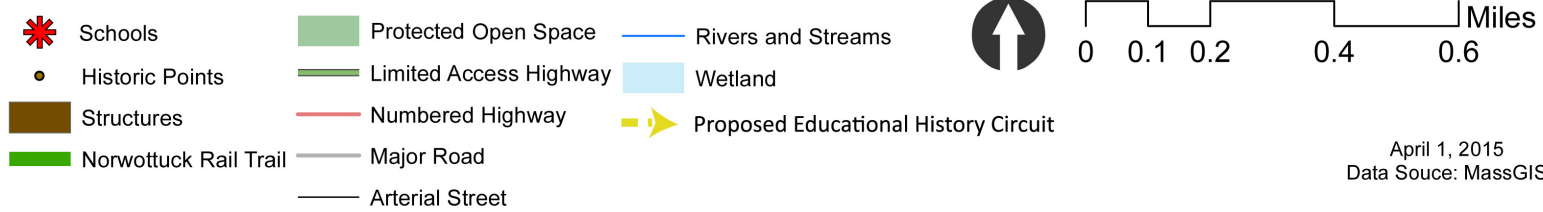
The rail trail passes directly through the historic town common in Hadley's historic district. Proposed signage at the catch up areas on either side of the common would provide historic details of the area, including history of the common, mapping historic homes and other historic facts to provide information about the historic ground users are traveling. Other educational signage and/or kiosks along the trail at significant points would include the significance of whistle posts, the history of the Old Hadley Cemetery, the importance and history of the Great Meadow and Connecticut River floodplain.

Proximity to the Hadley Elementary School, Hopkins Academy, North Star, Pioneer Valley Chinese Immersion Charter School, and Whole Children would be able to provide lessons in conjunction with these historic points and the values of the school wellness material. These educational establishments are all within walking distance of the rail trail and connect to this proposed circuit. Lengths of circuits could vary from one mile to six miles based on educational material, physical abilities of children, and overall goals of lesson plans.

Circulation: Educational History



Legend



April 1, 2015
Data Source: MassGIS

Figure 86: Educational History Circuit. Connecting the local schools with historic points in the area of the rail trail, including historic houses, the town common, and the Great meadow. Length of circuits could vary from one mile to five or six depending on the path chosen.

9.4 Long Distance Bicyclists

The Pioneer Valley is a popular place for avid bicyclists, with much of the topography in the region being of flat and rolling terrain. This topography is great for long distance bicycle rides, providing beautiful scenery while enjoying the pleasure and benefits of a long period of physical activity.

- The Norwottuck Rail Trail is the first connection for active bicyclists, allowing riders to travel from Northampton to Belchertown, with the opportunity to also connect to other adjacent rail trails.
- A proposed connection would be north to the Mount Warner Reservation, a five mile ride from Damon Road. Following historic Route 47 (River Drive) in the beautiful Connecticut River Valley, this northern connection would exit the rail trail at the Hadley town common and proceed north to connect to Route 47. Route 47 is one of the Western Massachusetts Scenic Byways, a network of roads originated as travel routes by native settlers. The Route 47 scenic byway connects with numerous other byways in western Massachusetts. Riders have the opportunity to proceed north as far as Vermont.
- A southern connection to Mount Holyoke would exit the rail trail again at the town common, this time traveling south on Route 47. The proposed connection would end at Old Mountain Road, which connects to Skinner State Park Road and leads up to the Summit House on top of Mount Holyoke. From the parking lot at Damon Road to the base of the park road is six miles. This southern bicycle route on Route 47 could continue to Mount Holyoke College in South Hadley.
- From Damon Road in Northampton, bicyclists can connect to Route 10 and ride north towards Hatfield.
- Finally, from the Northampton Bikeway connection, riders can take the scenic ride north towards Williamsburg on Russell Street, or south on Route 10 towards Easthampton.

Circulation: Long Distance Bicycle Routes

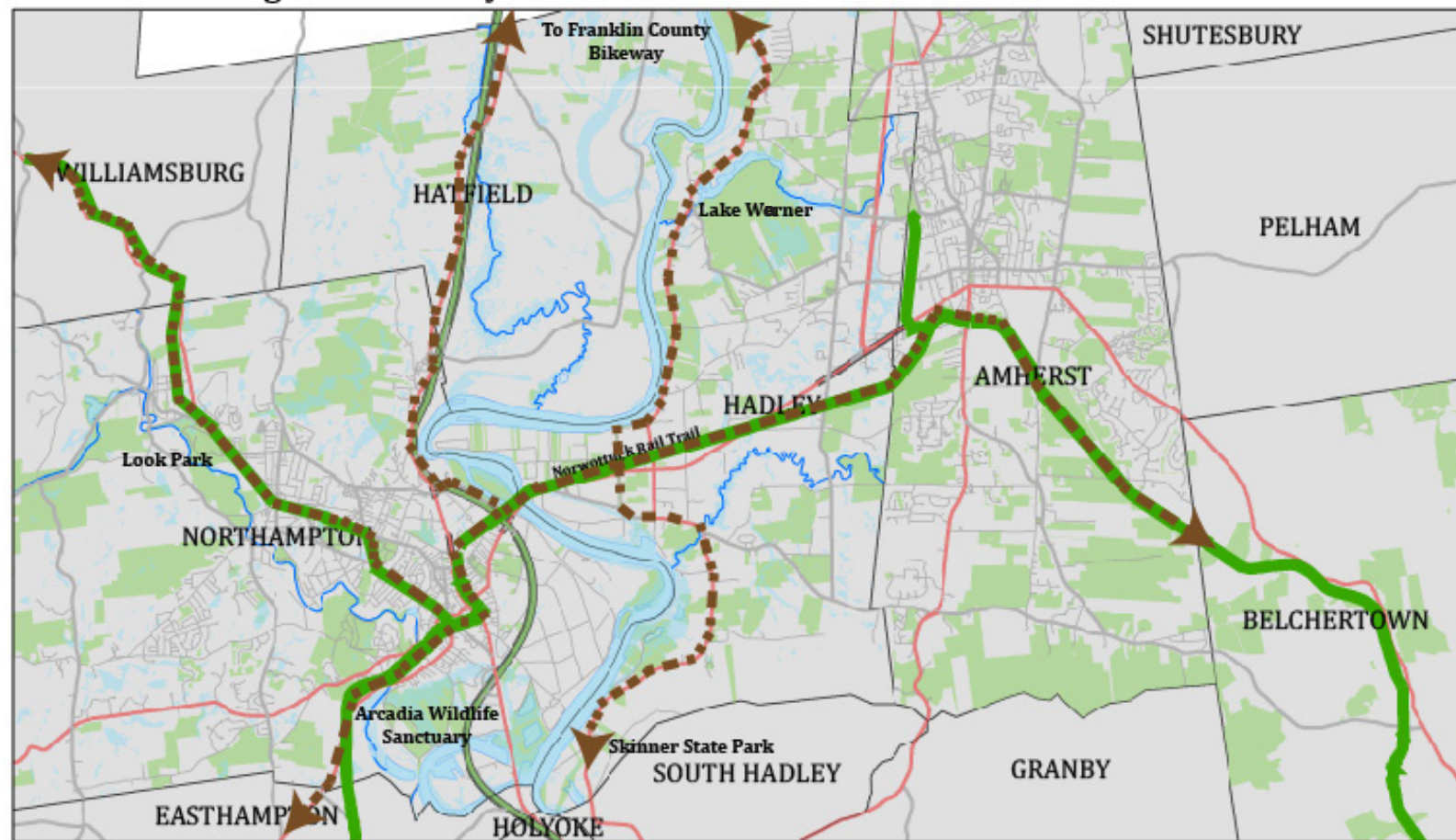
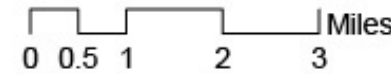


Figure 87: Long Distance Bicycle Circuits. Slower, family oriented routes follow the current rail trails in the area (solid green in the map), while road bicycle routes are noted by the dashed lined. These second set of routes allow for faster travel by a bicyclist, for a higher level of physical activity.

Legend

- Norwottuck Rail Trail
- Limited Access Highway
- Rivers and Streams
- Rail Trails Protected Open Space
- Wetland
- Lakes and Ponds
- Numbered Highway
- Major Road
- Arterial Street
- Proposed Long Distance Bicycle Routes



April 15, 2015
Data Source: MassGIS

9.5 Commuters

The Norwottuck Rail Trail serves as a commuting corridor for workers and students between the towns of Northampton, Hadley, and Amherst. As an alternative to driving or using public transportation, users are able to efficiently and safely travel without the hassle of the Russeel Street transportation route. The rail trail provides a direct line between colleges, businesses and communities.

The main linear connection for commuters is the rail trail itself. With numerous intersections, entrances and parking areas along the trail, there are different options for users to enter and exit the trail at areas that are closest to their travel destination. In Amherst, there is a spur off the rail trail that connects directly to the University of Massachusetts campus. The rail trail also runs adjacent Amherst College providing access near the college campus tennis courts, as well as access from Route 116 near downtown Amherst. Finally, the exit of the rail trail at Route 116 creates a connection to Amherst College, downtown Amherst, and Hampshire College along Route 116, which has wide safe bicycle lanes between the rail trail, the college, and downtown. An alternative route to Hampshire College would be along Bay Road, exiting the rail trail at Cross Path Road or the proposed connection at the Nissan Country dealership.

Another proposed commuting corridor would exit the rail trail at the Hadley town common and follow Route 47 north. Many vehicle commuters exit east onto Rocky Hill Road to get to the Amherst area. Rocky Hill Road is a fairly narrow and winding travel route without safe bicycle lanes. Car traffic is very high at several points during the day which can be very dangerous for bicyclist commuters. This project proposes commuting bicyclists exit Route 47 north of Rocky Hill Road at Huntington Road and follow it to where it joins Rocky Hill Road and leads into Amherst. This road has a lower level of traffic until it connects with Rocky Hill Road. At this point the road widens to a safer bicycle width as it approaches downtown Amherst.

Circulation: Commuter Bicycle Routes

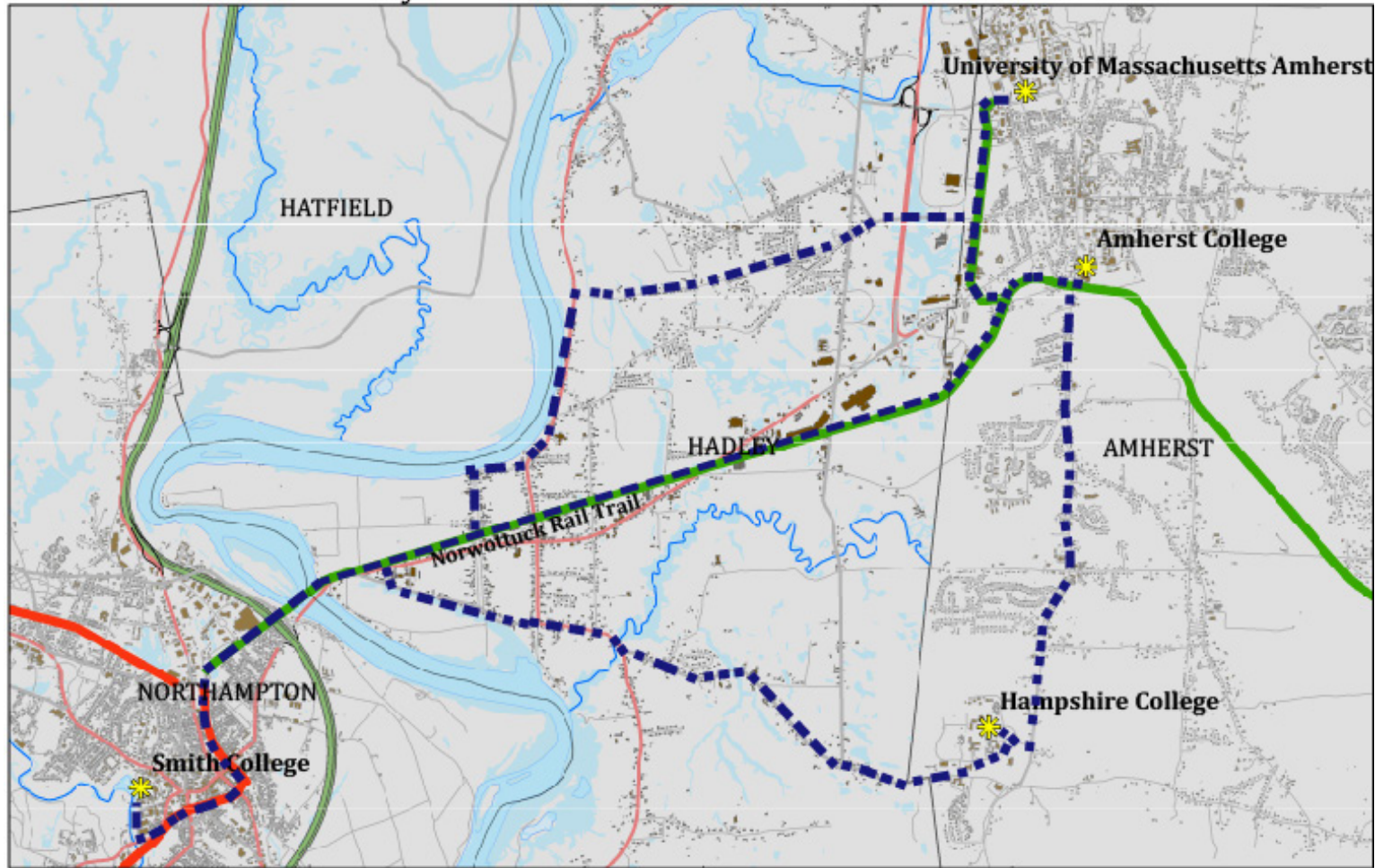
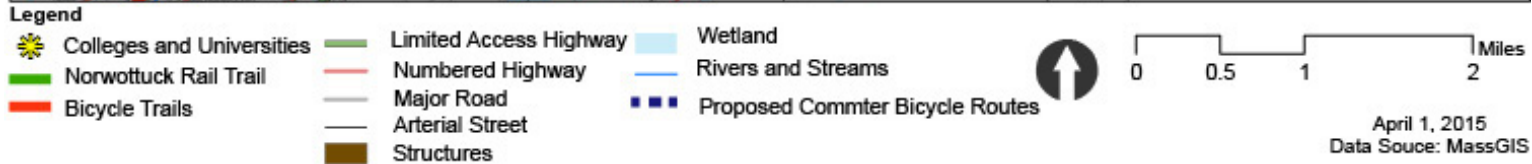


Figure 88: Commuter Bicycle Circuits. Several proposed routes to highlight commuting options between Northampton and Amherst. The main commuting route follows the Northampton Rail Trail. Northern and southern routes provide additional scenic routes for bicycle transportation. Commuters can take Bay Road for an alternative route to Hampshire College, or a northern alternative on Huntington Road to any destination in Amherst.



9.6 Fitness Center Connections

In conjunction with incorporating use of the rail trail to promote a healthy lifestyle, it is important to note the physical fitness facilities within close proximity to the rail trail. There are a variety of different gyms and fitness centers appropriate for different types of users. These proposed connections provide options for the various types of users of the rail trail. In addition to walking, bicycling, and educational amenities, these other physical fitness resources nearby can help balance a healthy workout routine.

The Pilates Studio. Studio is located at 104 Russell Street, offering mat classes as well as machines, The Pilates Studio focuses on health and fitness.

East Street Ballet. Located at 47 East Street, the East Street Ballet is a school dedicated to the practice of ballet technique, choreography and performance taught with elegance and grace. The classes accommodate ages four to adult.

Hopkins Academy. Recreational sports fields.

Hadley Elementary School. Recreational sports fields and playground.

Central Rock Climbing Gym. Located at 165 Russell Street in Hadley, the gym has bouldering, top roping and lead climbing routes. The gym also has fitness machines and weights, as well as offering yoga and fitness classes. The gym offers a discounted entry fee if you ride your bicycle to the gym.


Energia Fitness. Located next to Central Rock Gym at 173 Russell Street. Energia fitness is a personal training and spin studio. It offers various classes including spinning, bootcamp, pilates, and yoga.

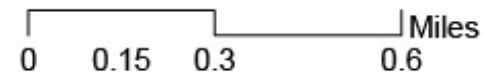
Planet Fitness. Open 24 hours 5 days a week at Mountain Farms Mall, the fitness studio offers numerous cardio machines such as treadmills, bicycles and ellipticals, as well as strength machines and free weights with personal training available.

Circulation: Fitness Centers Connections



Legend

- | | |
|--|---|
|  Norwottuck Rail Trail |  Rivers and Streams |
|  Limited Access Highway |  Wetland |
|  Numbered Highway |  Fitness Centers and Sporting Fields |
|  Major Road |  Proposed Fitness Connections |
|  Arterial Street | |



April 15, 2015
Data Source: MassGIS

Figure 89: Fitness Center Connections. Showing the connections to various fitness centers within close proximity to this area of Hadley. Included in this are also recreational sports fields, located at the two public schools and the playground at Hadley Elementary School.

9.7. Circulation Conclusion

In summary, these six proposed connections and circuit loops -- short distance walkers, long distance walkers, educational history, long distance bicyclists, commuters, and fitness center connections -- all work to provide numerous options to the wide range of users of the rail trail. Everyone from a parent with child in a stroller, to classroom students, to the person training for a marathon will be able find a circuit that best suits them. These different circuits will allow users to have choices of where to go and what to do. Some may choose to take a longer path than they normally walk to explore a new area, increasing their physical activity level, as well as the awareness of their surroundings on and off the rail trail.

Each person has different levels of physical activity they are able to obtain on a regular basis. Elderly may typically fall into the category of short distance walkers, where they are limited to walking from one catch up area to another at quarter mile increments, needing to sit to catch their breath or rest their muscles at each station. Students on class trips will benefit from the physical activity allowing them to get out of their classroom chairs and learn hands-on about some of the history of Hadley. There are numerous opportunities around the rail trail to provide users alternatives to the linear travel and standard exercise. This project is highlighting just a few of them (such as the well-signed at the Damon Road parking lot) and users should be aware of other options for exploring as they use the rail trail for whatever their purpose. The idea of this is to increase the physical activity of those using the trail as well as increase awareness of the history and native culture of the area.

In addition to the historical and native aspects of the rail trail, this project is proposing location of both permanent and temporary public art displays. These public art pieces provide an opportunity to expose local artist talent. In addition to their visual improvement to the rail trail, and the engagement they provide for users, they too can become destination points for the users of the trail.

Chapter 10: Master Plan – Norwottuck Rail Trail

Drawing 1 of 13: Damon Road

During the rehabilitation of the Norwottuck Rail Trail, major improvements were made to the Damon Road Parking lot. Handicap accessibility was improved, picnic tables and informational kiosks were added, as well as additional signage and vegetative plantings. The improvements proposed by this master’s project include addition of more ornamental shade trees to cover parking spaces, adding seasonal color and interest to the area. In addition to plantings, this is an ideal place to have a collection of public art pieces. At the intersection of Russell Street and Damon Road, it is a heavily travelled area with people passing by both via vehicle and on the rail trail. Proposed placement of art pieces include larger pieces in the area of the corner intersection, bringing attention to the area. Smaller pieces would be placed around the parking lot and picnic areas. Two pieces would be proposed to border each side of the rail trail as users travelled onto the Lattice Truss Bridge, where users access the rail trail.

Drawing 2 of 13: Bridge

Upon crossing the Lattice Truss Bridge, an additional two pieces of art would be proposed to border the exit of the bridge, potentially as part of a set of four similar structures to balance the movement across the historic structure. After passing over the bridge, the rail trail becomes rather enclosed with large trees and shrubs. In this section it is proposed to open up some of the existing areas that provide views into the great meadow, to the Berkshire Mountains in the east, and to Mount Warner in the north. This enclosed section is quite nice and shaded in the summer and users receive a prospect-refuge feeling as they get glimpses of the landscape in the distance as they pass through enclosed and open areas.



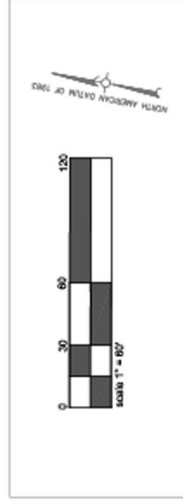
Figure 90: Calligraphie Ferroviaire “Calligraphy Railway” by Daniel Steenhaut & Francoise Geeraerd at the rail trail Woluwe-Saint-Lambert near Brussels, Belgium.



Figure 91: Clipper City Rail Trail; one of many abstract steel and aluminum pieces by Robert Lorenson and Dale Rodgers.

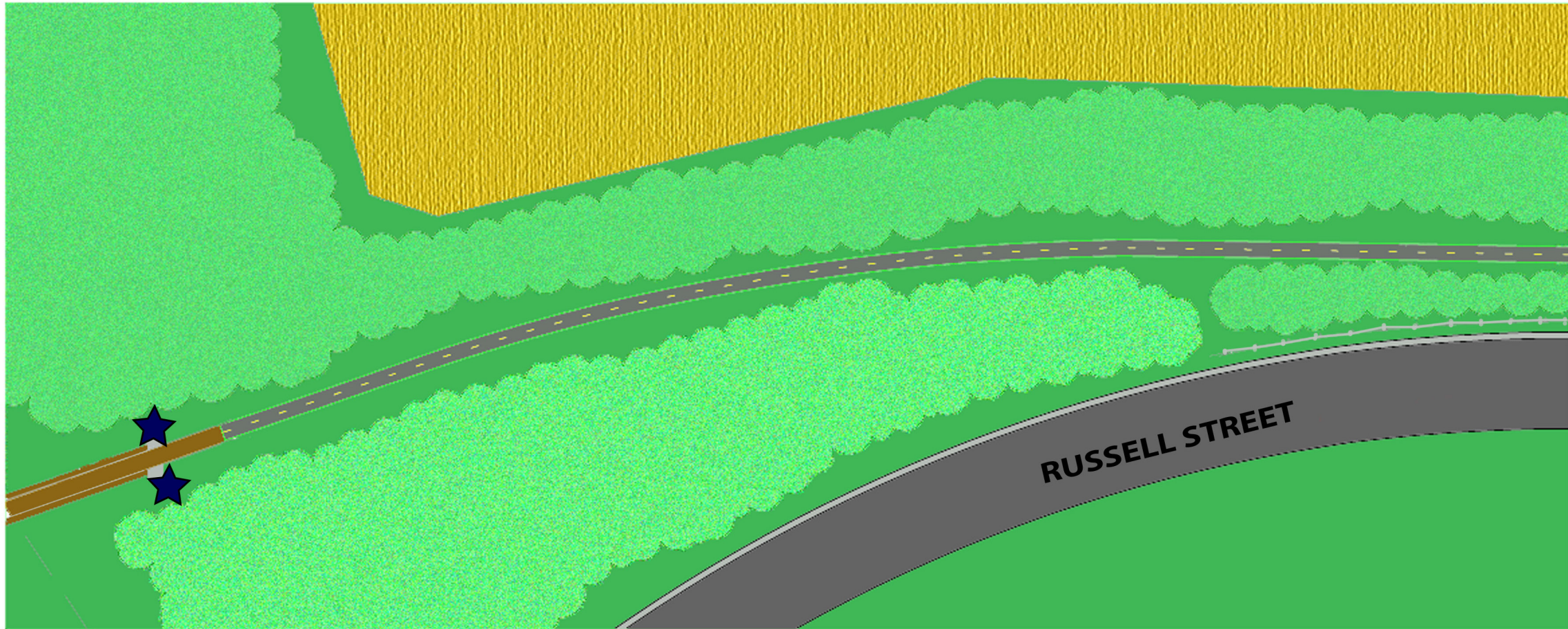


Damon Road
 Norwottuck Rail Trail
 Drawing 1 of 13



Legend

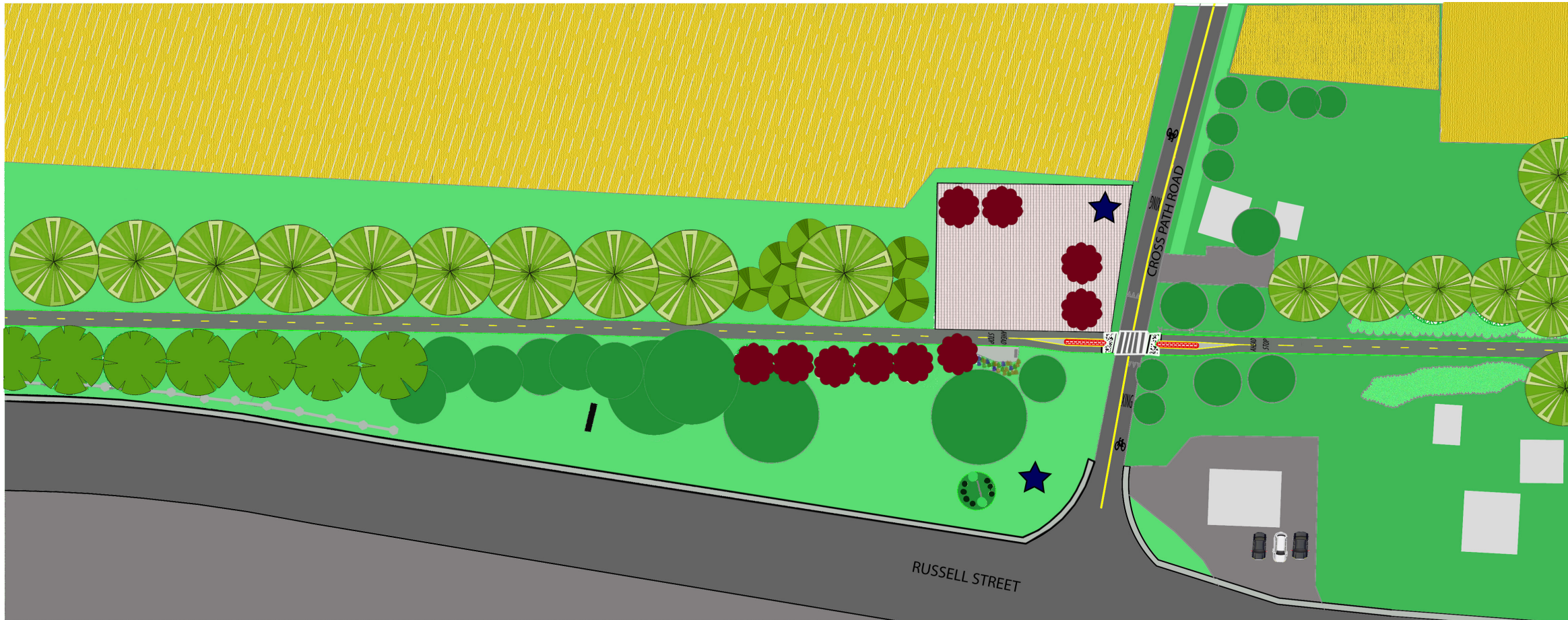
- ★ Proposed Artwork
- 🌺 Proposed Ornamental Shrubs
- 🌿 Proposed Shrubs
- 🌲 Proposed Evergreens
- 🌳 Proposed Deciduous
- Existing Trees and Shurbs



Bridge
Norwottuck Rail Trail
Drawing 2 of 13

Legend

- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shurbs



Cross Path Road
 Norwottuck Rail Trail
 Drawing 3 of 13

- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shrubs

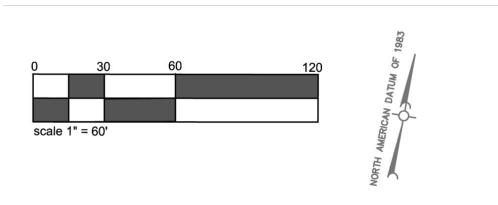
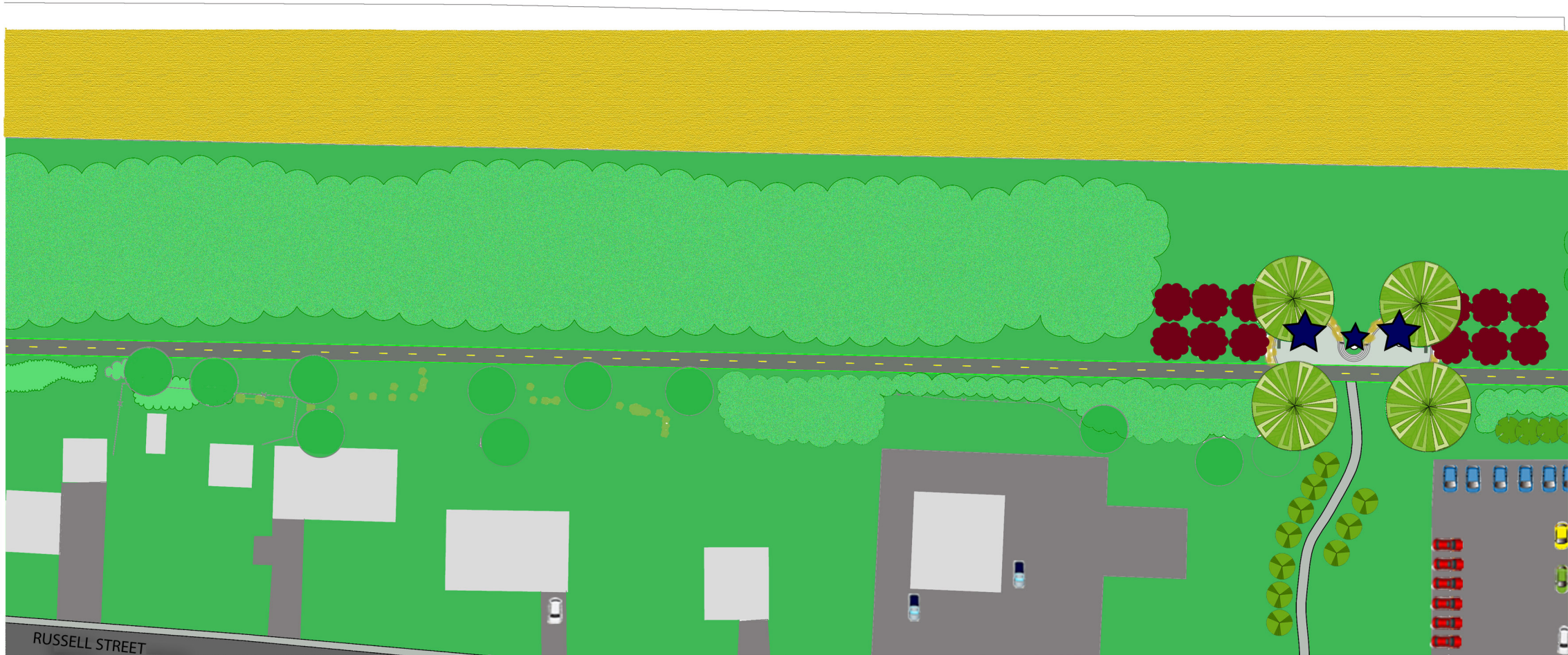




Figure 92. Proposed patio at Cross Path Road



Figure 93. Proposed plantings at catch up area near Cross Path Road.



Residential
Norwottuck Rail Trail
Drawing 4 of 13

Legend

- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shurbs

0 30 60 120
scale 1" = 60'

NORTH AMERICAN DATUM OF 1983



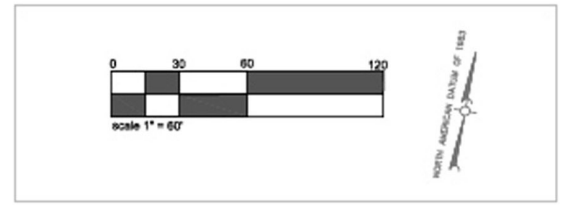
Figure 94. Spring, Summer and Fall proposed plantings for catch up areas.





Dealership
 Norwottuck Rail Trail
 Drawing 5 of 13

- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shrubs



Drawing 6 of 13: Agriculture 1

This section of the trail is largely enclosed with mature deciduous trees and understory shrubs. Some areas are more dense with vegetation than others, giving variation along the trail between light and shaded areas.

Drawing 7 of 13: Agriculture 2

This area is mainly a stretch of continuous enclosed and shaded, creating a bit of monotonous section of trail. While the enclosed feeling created by the vegetation is cool in the summer and lush and green, proposed placement of public art pieces evenly spaced would add additional interest to this section of trail. Located in the Connecticut River flood plain, proposed art pieces would be placed on permanent raised podiums, allowing placement of temporary pieces to be rotated on a regular schedule.

Drawing 8 of 13: West Street

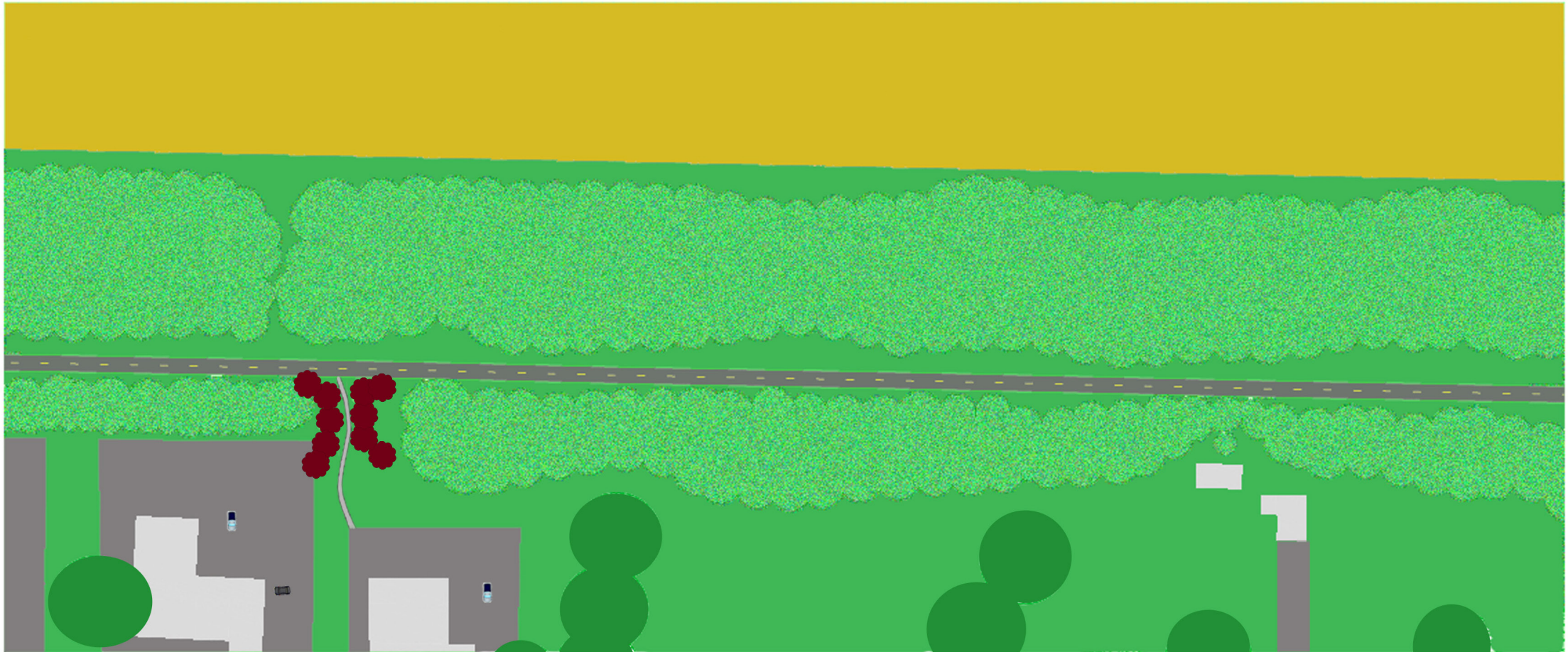
The next section of the rail trail crosses West Street and the Hadley town common. The town common, being of historic significance, has regulations to maintain the original character of the site. Where the rail trail crosses the common, no site design work is proposed. On each side of the town common are catch up areas. The western catch up area will include proposed ornamental tree and shrubs. Perennial plantings will surround the catch up area, with a variety of species to promote colors and textures throughout the seasons. The eastern catch up area abuts a proposed water retention with numerous proposed wetland plantings. The wetland planting will vary in density and shape, providing a buffer between the rail trail and the abutting residential property.



Figure 96: Explosion by Serigo Castillo Mandiola. Boston.



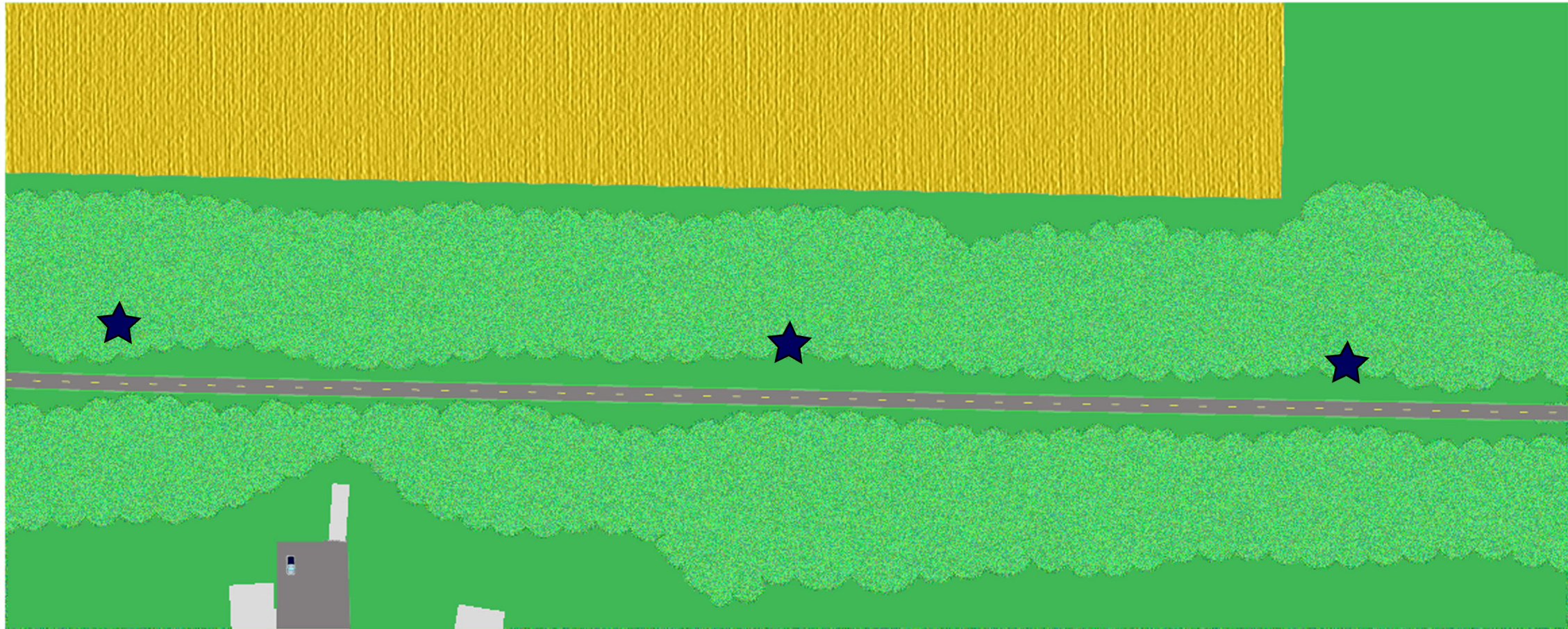
Figure 97: Eruption by Serigo Castillo Mandiola. Santiago de Chile.



Agriculture 1
 Norwottuck Rail Trail
 Drawing 6 of 13

Legend

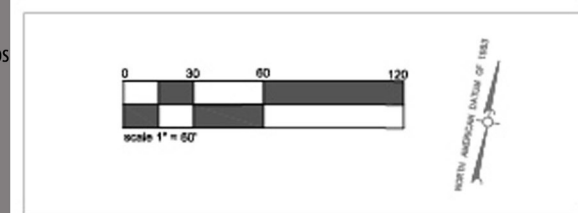
- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shurbs



Agriculture 2
Norwottuck Rail Trail

Drawing 7 of 13

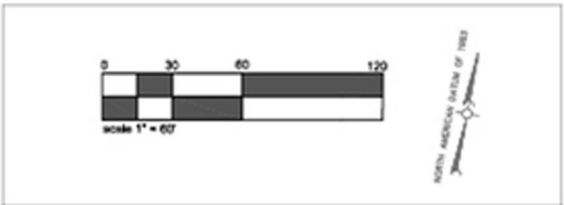
- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shurbs





West Street
Norwottuck Rail Trail
Drawing 8 of 13

- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shurbs



Drawing 9 of 13: Hadley Depot

Located on Railroad Street, Hadley Depot begins after the rail trail passes through the town common and West Street. As mentioned in the previous section, the catch up area is proposed with perennial flower plantings. A low lying wetland exists here, overgrown with invasive species. A proposed overhaul of this area would include removing the invasive species and repopulating the area with native wetland species. Plantings of varying height will create a unique space and also maintain a buffer between the rail trail and the abutting house. The Hadley Depot is one of the areas of this project with the most potential. The rehabilitation project included adding parking spaces, upgrading handicap accessibility, adding benches and picnic tables. On the south side of the rail trail are several old buildings, one is an old potato factory building. This project involves a complete renovation to this old brick building, turning it into a building that on the bottom floor would hold a café with outdoor patio seating, with additional mixed uses on the upper floors. The side of another commercial building is the ideal location for a large mural, which would be visible by both drivers on Railroad Street and users of the rail trail. Moving east on the rail trail, just beyond a garage storage building, is an old cement platform. Proposed here would be a large public art exhibit, with accessibility directly off the trail. Ideally this would be an interactive exhibit where people could create and interact with the piece using sounds, light, or movement.

Drawing 10 of 13: Hadley Depot 2

Further down Railroad Street is a commercial building that holds several businesses, including The Quarters and Blueprint Tattoo and Fine Art Gallery. Parking is provided at the building for business use only. The Quarters is an arcade bar with outdoor patio seating, an arcade themed bicycle rack, and an entrance to the building off of the rail trail. The back side of this building is very close to the rail trail and would be an ideal place for a mural. Proposed across from the building, on the north side of the rail trail would be a small semicircular seating area. Flowering shrubs would line the seating area, and a piece of public art would be proposed in the middle of the space. Picnic tables are located under existing trees on the east side of the building, past another parking lot. Addition plantings of tall deciduous trees would be proposed here with the existing trees, including the addition of more picnic tables.



Figure 99: Mural along the Chandler Bike Path, California.



Figure 100: Fairfield Heritage Trail includes a sensory loop with musical instruments with theatred mallets. Ohio.



Hadley Depot
Norwottuck Rail Trail

Drawing 9 of 13

Legend

- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shurbs

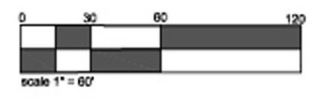




Figure 100: Proposed cafe and seating at Hadley Depot. Old potato building adaptive for mixed uses.



Hadley Depot 2
 Norwottuck Rail Trail
 Drawing 10 of 13

- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shurbs

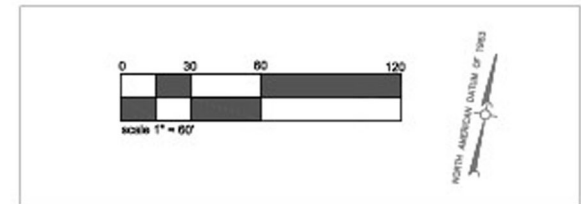




Figure 101: Proposed seating area, and vegetative planning including a public art piece.

Drawing 11 of 13: Middle Street

After the Hadley Depot, the rail trail crosses Middle Street. A catch up area on each side of the street will be improved with proposed perennial plantings, just as at the previous catch up areas. Travelling onto the east side of Middle Street, evergreen trees create a border between the rail trail and Golden Court to the south before an eight foot tall fence begins. This fence creates a barrier between the Golden Court and Burke Way housing developments and the rail trail. Additional evergreen plantings would be proposed on the north side of the rail trail, creating a buffer between the abutting residential home and the trail.

Drawing 12 of 13: Orchard

The next section of trail includes a large proposed orchard. Although the tall fence continues to run behind both the Golden Court and Burke Way housing developments, a proposed path and gateway would provide access for residents to get onto the rail trail without needing to walk all the way around either end of the fence. Assorted variety of fruit crops would grow in the orchard and be available for picking for all of the general public.

Drawing 13 of 13: East Street

In the final section of this project, the large fence has ended. Here is the only section of the rail trail in this project that has a water element, and is the main proposed improvement to this area. A large deck is proposed over the small pond and stream which is often filled with water fowl. The water table here varies with the seasons, the deck would also overlook a small meadow behind the commercial building on East Street, providing a pleasant view north into the open meadow surrounded by trees, as well as a view south across a perennial nursery to the Holyoke Range. Ornamental trees would be proposed planted between the rail trail and the driveway to the commercial building, which holds East Street Ballet Studio, a printing press, ceramic studio and other businesses. Additional shrubs would be planted behind the commercial building, with a path leading into the meadow.



Figure 102: Apple orchard on The Underground Farm. Byron Talbott.

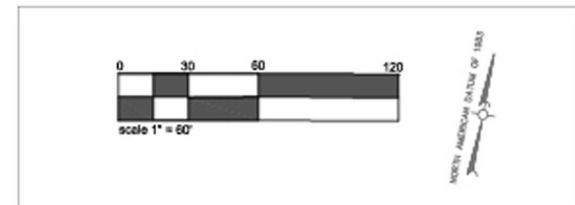


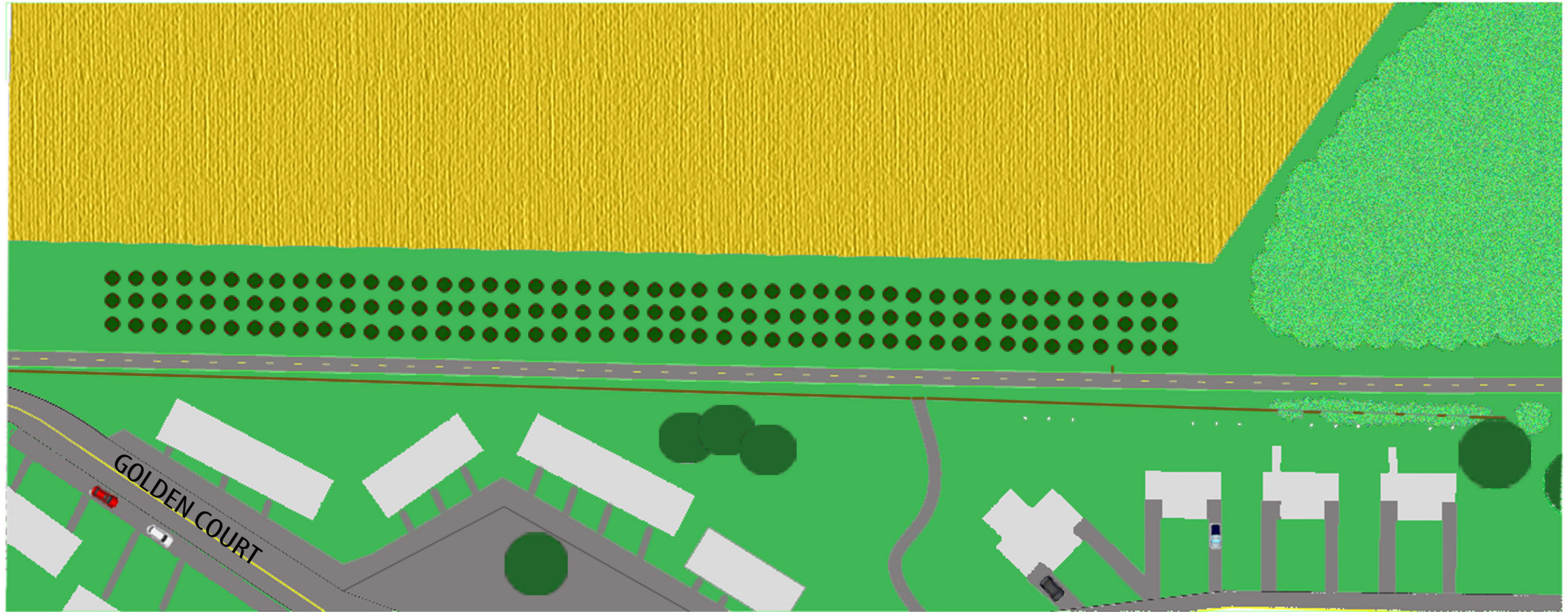
Figure 103: Solarpowered sculpture in the Netherlands. By Dan Corson.



Middle Street
Norwottuck Rail Trail
Drawing 11 of 13

- Legend**
- ★ Proposed Artwork
 - Proposed Ornamental Shrubs
 - Proposed Shrubs
 - Proposed Evergreens
 - Proposed Deciduous
 - Existing Trees and Shurbs





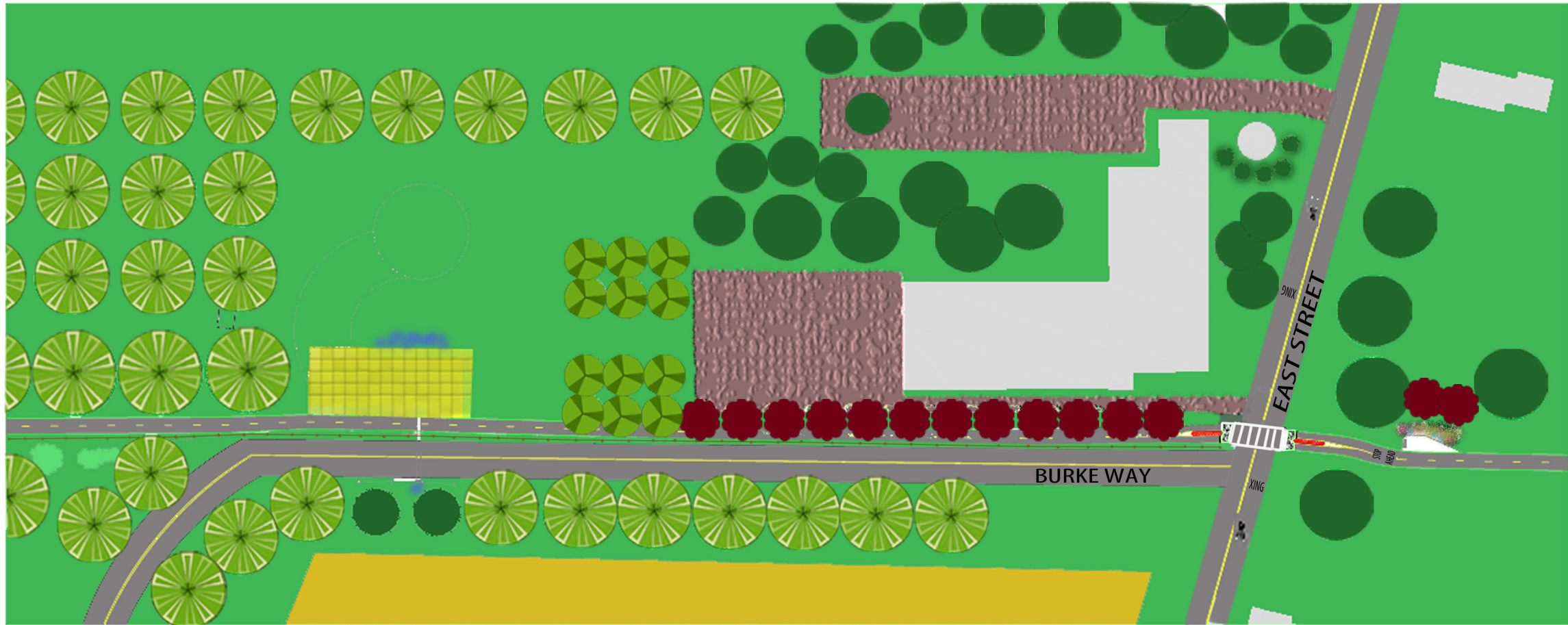
Orchard
Norwottuck Rail Trail
Drawing 12 of 13

Legend

- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shrubs



Figure 103: Proposed platform over looking a small water way.



East Street
Norwottuck Rail Trail
Drawing 13 of 13

Legend

- ★ Proposed Artwork
- Proposed Ornamental Shrubs
- Proposed Shrubs
- Proposed Evergreens
- Proposed Deciduous
- Existing Trees and Shurbs

CHAPTER 11: CONCLUSION

This project proposes improvements to the Norwottuck Rail Trail that promote a happy, healthy, active and engaged lifestyle for all users of the trail. The theme of this project lies within the research of numerous studies supporting that an active person is a person of better health, which in turns helps lead to a happier lifestyle. The Norwottuck Rail Trail provides a place for people of a wide range of age and physical fitness to get outside and interact with the environment around them, enjoying everything from the sunlight to the mountain views. In addition to the proposed design improvements, proposed circuit loops provide even further options for exploration and exercise among rail trail users. Design strategies framed around spatial theories of environmental design include gathering spaces, landmarks, enclosed areas and spaces with views. In addition to this, a suggested vegetation planting palette provides species that accent each season through leaf and bloom colors, aroma, and texture.

Observations from case studies of widely used rail trails throughout the United States were taken into consideration when making suggested improvements to the Norwottuck Rail Trail. Grouping features into different categories of natural infrastructure, sporting and/or recreational features, supportive infrastructure, built infrastructure, connections, and public art allowed successful features to be identified and applied to sections of this project where appropriate. In addition, various types of public art were explored in terms of evoking senses of rail trail uses. Some of these included musical instruments with teathered mallets, sculpures with solar or wind power, and pieces reflecting the native heritage of the area. In all, this project provides design suggestions to support and enhance the livelihood of rail trail users as well as enhance the identity and function of the rail trail as a whole.

APPENDICES

APPENDIX A: VEGETATION LIST

DECIDUOUS TREES	
<i>Acer ginnala</i>	Amur Maple
<i>Fagus grandifolia</i>	American Beech
<i>Acer platanoides 'Crimson King'</i>	Crimson King Norway maple
<i>Metasequoia glyptrostroboides</i>	Dawn Redwood
<i>Larix decidua</i>	European Larch
<i>Ginkgo biloba</i>	Ginkgo
<i>Tilia cordata</i>	Littleleaf Linden
<i>Acer rubrum</i>	Red Maple
<i>Carya ovata</i>	Shagbark hickory
<i>Nyssa sylvatica</i>	Tupelo
<i>Fraxinus americana</i>	White Ash
<i>Quercus alba</i>	White Oak
ORNAMENTAL TREES	
<i>Cotinus obovatus</i>	American Smoketree
<i>Pyrus calleryana</i>	Callery Pear
<i>Cercis canadensis</i>	Eastern Redbud
<i>Acer palmatum</i>	Japanese Maple
<i>Stewartia pseudocamellia</i>	Japanese Stewartia
<i>Cornus alternifolia</i>	Pagoda Dogwood
<i>Malus sargentii</i>	Sargent's Crabapple
<i>Amelanchier arborea</i>	Serviceberry
<i>Oxydendrum arboreum</i>	Sourwood
<i>Magnolia stellata</i>	Star Magnolia
SRHUBS	
<i>Viburnum dentatum</i>	Arrow wood
<i>Vaccinium spp.</i>	Blueberry species
<i>Buddleja davidii</i>	Butterfly Bush
<i>Clethra alnifolia</i>	Clethra
<i>Hamamelis virginiana</i>	Common witch hazel

<i>Juniperus horizontalis</i>	Creeping Juniper
<i>Physocarpus opulifolius</i>	Eastern Ninebark
<i>Virburnum carlesii</i>	Korean Spice Viburnum
<i>Kalmia latifolia</i>	Mountain Laurel
<i>Hydrangea quercifolia</i>	Oakleaf Hydrangea
<i>Spiraea japonica</i>	Spiraea
<i>Comptonia peregrina</i>	Sweet fern
PERENNIALS	
<i>Achillea spp.</i>	Yarrow
<i>Alchemilla mollis</i>	Lady's Mantle
<i>Asclepias tuberosa</i>	Butterfly Weed
<i>Aster novae-angliae</i>	New England Aster
<i>Astilbe spp</i>	Astilbe
<i>Calamagrostis x acutiflora 'Karl Forester'</i>	Karl Forester
<i>Chasmanthium latifolium</i>	Northern Sea Oats
<i>Dendranthema spp.</i>	Chrysanthemum
<i>Dictamnus albus</i>	Gas Plant
<i>Echinacea purpurea</i>	Purple Coneflowers
<i>Gallardia x grandiflora</i>	Blanket Flower
<i>Hemerocallis spp</i>	Daylily species
<i>Iris sibirica</i>	Siberian Iris
<i>Lavendula agustifolia</i>	Lavender
<i>Monarda didyma</i>	Monarda
<i>Perovskia atriplicifolia</i>	Russian Sage
<i>Salvia officinalis</i>	Sage
<i>Sedum spp.</i>	Sedum species
<i>Stachys byzantina</i>	Lamb's Ears

APPENDIX B: RAIL TRAIL PRECEDENT STUDIES MATRIX

TRAIL	LOCATION	LENGTH	NATURAL INFRASTRUCTURE	SPORTING & RECREATION	SUPPORTIVE INFRASTRUCTURE	ARCHITECTURAL ELEMENTS
Manhan Rail Trail	Easthampton, MA	9 mi	Forested and cool areas Residential areas Arcadia Wildlife Sanctuary Overlook of CT River Oxbow	Skateboard park Basketball court	Picnic tables Parking Restrooms Water	Easthampton business district Historical conflict/battle spur Old train depot Old mill buildings Numerous bridges Gateways
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Follows north and south shores of river's west branch		Benches Trash receptacles	Two bridge crossings Built atop levees Interpretive signage about the lumber heritage of the region
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Runs along river: stream restoration project Wildlife Trees and landscaped areas Community gardens	Soccer fields Playgrounds Basketball courts Tennis courts Swimming pool/splashpad	Outdoor shelters Picnic shelters Plazas and event areas Fountains Parking Amphitheater	Bridges Business district/dining areas Old neighborhoods
Legacy Trail	Lexington, KY	12 mi	Green spaces Native plant landscaping Riparian areas Rolling hills		Three trailheads with parking, air and minor repair tools Stone mileage markers	Urban office parks Horse country Bridges Suburban neighborhoods Tunnels
Mill Creek Greenway	Cincinnati, OH	10.6 mi	Follows urban waterway Salway Park with habitat installation Farmlands		Picnic tables Parking Restrooms Water	Light industrial areas Residential and housing developments Historic stone structures at one entrance to trail
The Discovery Trail	Northwest, WA	7.6 mi	Views of ocean, grassy dunes, and forest groves Exquisite wildlife Public beaches		Light houses Parking Restrooms	Quaint fishing villages Lewis and Clark Interpretive Center

TRAIL	LOCATION	LENGTH	CONNECTIONS	PUBLIC ART
Manhan Rail Trail	Easthampton, MA	9 mi	Numerous entrances used by residents Connects to Norwottuck Rail Trail Spur to Mount Tom	Millennium Mural
Susquehanna River Walk and Timber Trail	Williamsport, PA	4.2 mi	Creates important connection between residents and the river	Lumber-themed public art including Life-sized sculpture of a lumber camp worker
Little Sugar Creek Greenway	Mecklenburg County, NC	19 mi	Connections between different parks Medical Center Community College Commuter route to uptown Charlotte	Public art pieces
Legacy Trail	Lexington, KY	12 mi	Connects green spaces, neighborhoods and urban parks Connects to memorial art garden	Explores the the community's culture, history, and environmental character and reveal it through public art Murals
Mill Creek Greenway	Cincinnati, OH	3 mi	Connects two short disconnected segments Connects to Salway Park and Caldwell Park	Salway Park includes public art installation
Heritage Rail Trail	Franklin and Madison Counties, OH	7 mi	Parallel 4 mi section for horseback riders Washington Township Homestead Park	
The Discovery Trail	Northwest, WA	7.6 mi	Multiple trailheads Connections to villages	Bronze sculptures along path commemorating Lewis and Clark's journey Grey whale skeleton
Oholone Greenway	Alameda and Contra Costa Counties, CA	5.3 mi	Doubles as a communiting corridor Connects parks and green spaces	Interactive public art
Chandler Bikeway	Los Angeles County, CA	2.8 mi		Two unique sculptures along trail Collection of murals on buildings

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