

Revealing Worcester's Hidden Gem: Promoting the East – West Trail



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Worcester Community
Project Center

Revealing Worcester's Hidden Gem: Promoting the East-West Trail

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Abstract

The Park Spirit organization developed a 14 mile urban hiking trail that incorporates 20 of Worcester's green spaces. The trail, known as the East-West Trail, was hidden in the heart of Worcester and Park Spirit needed help in promoting and enhancing the experience for people hiking the trail. Consequently, the goal of this project was to identify whether and why people were using the East-West Trail through interviews, focus groups, surveys, and participatory research. We then created an application that would facilitate increased usage of the trail. Additionally, we developed a physical brochure for non-technical users and organized a promotional event on the trail.

Acknowledgements

Our project would not have been successful without the contributions of many individuals. We would like to thank everyone who has taken their time and energy to support and help us throughout this project.

Our first thank you is to our sponsors, Rick Miller and Brittany Legasey from the Park Spirit of Worcester Inc. who allowed us the opportunity to work with them on this project. Their knowledge and guidance was essential for our project's success. We would also like to thank all the members of the Park Spirit of Worcester Inc., specifically Ruth Seward, Bob Locke, and Greg Droerschler for attending our focus groups and sharing their knowledge.

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We also want to thank Robyn Lilly of Big Brother Big Sister Organization in Worcester for collaborating with us during our Easter egg hunt and making that event possible.

A huge thank you to Jim Monaco who helped us with all of our technology needs. The information and guidance from Jim helped tremendously in the development of our web application as well as our video.

Finally thank you to our advisors from Worcester Polytechnic Institute, Corey Dehner and Derren Rosbach. Each of them shared new ideas for our project and came in excited about the work we were doing every day. We also want to acknowledge Laura Roberts for her dedication to the Worcester Community Project Center.

Executive Summary

Worcester has over 60 parks and green spaces throughout the city covering over 1,000 acres of land (City parks, 2017). Rick Miller and Colin Novick, Executive Director of the Greater Worcester Land Trust, began planning the concept of an urban trail in 2001 in order to connect all of these green spaces. By 2014 they completed a map of the 14 mile trail and a year later the Park Spirit of Worcester Inc. began allocating funds for the project known as the East-West Trail (Spirit, 2016). The trail spans the entire city starting in the Cascades and ends at Lake Quinsigamond.

The Park Spirit of Worcester Inc. realized that the trail was not being utilized to its potential and suggested the main reason for the underutilization was that Worcester residents were not aware of the trail. We created a mobile web application in order to help Park Spirit continue their mission:

“to protect, to promote, to enhance, and to advocate for Worcester City Parks for all individuals to enjoy these public resources”

The overall goal of this project was to work with the Park Spirit of Worcester Inc. to enhance the overall trail experience for Worcester residents of all ages thereby increasing utilization of the East-West Trail.

Methodology

To meet the project goal, we developed the following objectives:

1. Assess what Worcester residents want in green spaces
2. Estimate Worcester residents' awareness of the East-West Trail
3. Compile an inventory of points of interest along the East-West Trail
4. Assess the current conditions of the green spaces that comprise the East-West Trail
5. Determine the most appropriate technology to enhance trail user's experience
6. Develop an interactive electronic mobile experience for trail users
7. Develop sustainable ways for Park Spirit to successfully market the East-West Trail

To successfully promote the East-West Trail we used focus groups, interviews, surveys, and participatory research. Our first two objectives led to early findings that Worcester residents are aware of parks and trails in Worcester but are not aware of the East-West Trail.



1: Graph showing our findings of Worcester resident's awareness based on our survey.

We also found that if parks and trails had certain amenities, residents would be more likely to

Park Ammenities	Yes	Maybe	No
Accessible Restrooms	64.86%	20.12%	15.02%
Postings about Community Events	53.55%	34.32%	12.13%
Paper Copies of Trail Maps	47.92%	34.52%	17.56%
Interactive Challenge	36.06%	33.64%	30.30%
Electronic Map	61.98%	22.46%	15.57%
Increase Number of Trail Markers	54.38%	31.02%	14.16%
Dog Friendly Components	49.55%	23.44%	27%
Additional Parking Availabilities	56.68%	28.49%	14.84%

2: Table of amenities that Worcester residents want in green spaces

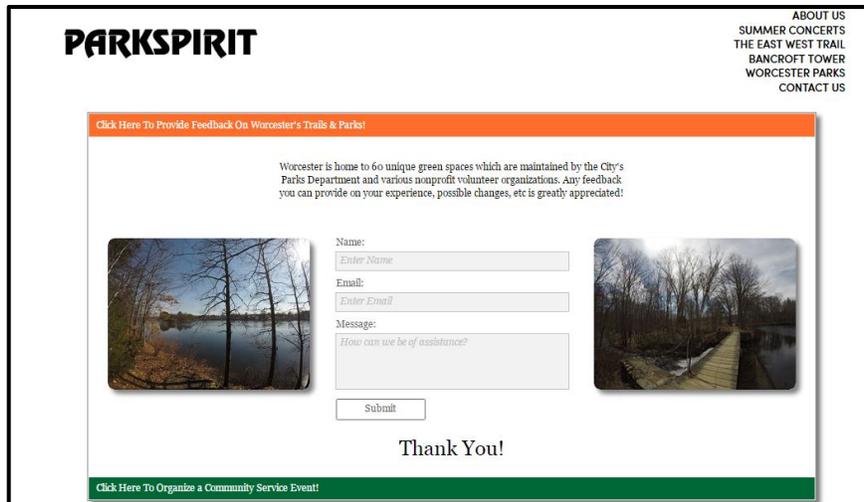
During our participatory research we evaluated the trail as well as the 20 parks along it, see Appendix 6 for the criterion used for the evaluations. Along with the evaluations, a list of points of interest, based off of relevance to a trail user, was created. These points of interest were then implemented in the mobile application created in Adobe Muse. Upon further interviews and research we found sustainable ways for Park Spirit to successful marketing of the East-West Trail, which led to the development of a campaign targeting Worcester residents' awareness of the East-West Trail.

The Awareness Campaign

Through our research we developed the awareness campaign comprised of the following seven components.

1. Expansion of the Park Spirit Website

The Park Spirit of Worcester Inc.'s website was created using the Adobe Muse software and contained five main pages: "Home", "About Us", "The East-West Trail", "Bancroft Tower", "Worcester's Parks". We added a sixth main page, "Contact Us". The "Contact Us" section allows users to communicate issues along the trail and give feedback to Park Spirit easily.

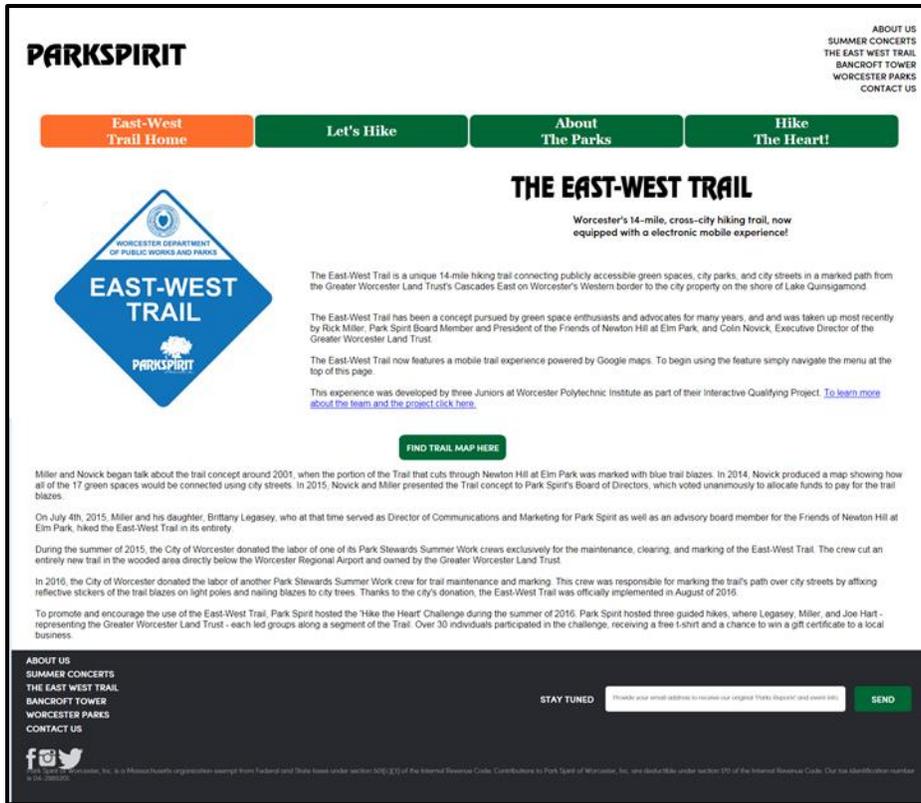


3: "Contact Us" page on the updated Park Spirit website

Furthermore, we expanded their “Worcester’s Parks” section to include a biographical page about each of the 60 parks in Worcester. The expansion of Park Spirit’s website made the new web application and the pre-existing website uniform and easier to use.

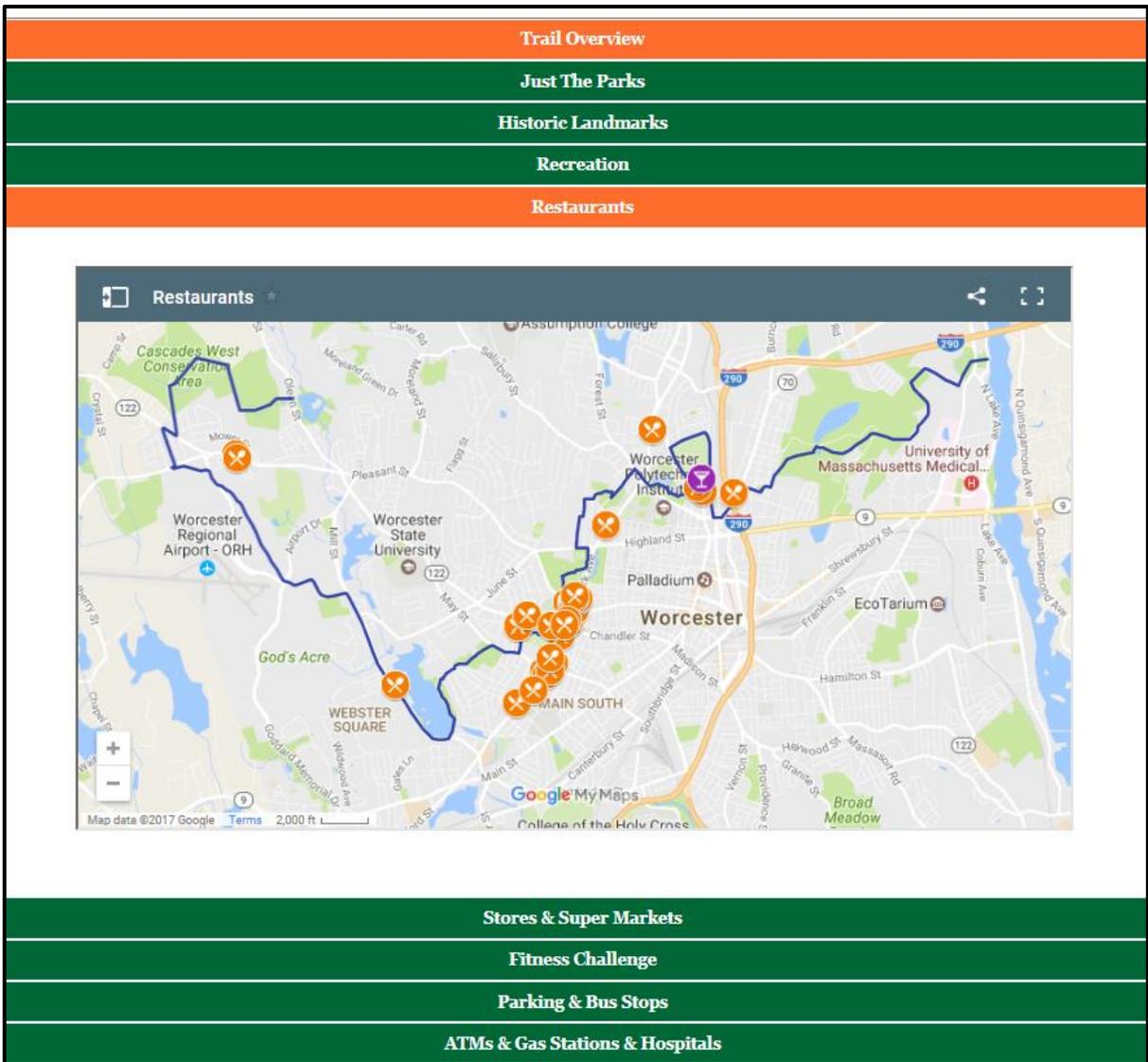
2. Development of a Mobile Web Application

Using the Muse software we created a mobile web application under the “The East-West Trail” section of Park Spirit’s website. This web application contains four main pages: “The East-West Trail”, “Let’s Hike”, “About the Parks”, and “The Hike the Heart Challenge”.



4: Home page of the web application.

Based on our research, we found that 85% and 70% of responses to our survey stated that electronic maps and an interactive challenge, respectively, would make them more likely to use city green spaces. The “Let’s Hike” page contains Google Maps filled with different points of interest along the trail, GPS tracking, and interactive physical challenge.



5: "Let's Hike" page showing the Google Map and different layers of maps.

“The Hike the Heart Challenge” page contains another set of Google Maps containing another physical challenge that Park Spirit hosts every year. Finally the “About the Parks” page contains information about the green spaces along the East-West Trail similar to the information that is in the “Worcester’s Parks” page in the Expansion of the Park Spirit Website.

3. The East-West Trail Brochure

We designed and distributed a trifold brochure to serve as both an informative and incentivizing medium for publicizing the uniqueness of the East-West Trail. The brochure also contains a map of the trail that spans the three inside panels so it can be used as a paper trail map for trail users. Based on our survey 83% of respondents said they would like a paper copy of a map.

4. A Promotional Video for the East-West Trail

We developed a promotional video for the East-West Trail that provides another method of publicity for the trail. The three minute video is comprised of live-action footage of residents hiking at different points along the trail and highlights a variety of the twenty green spaces that the trail spans.

5. An Annual Egg Hunt at Elm Park

In collaboration with Big Brother Big Sister on behalf of the Park Spirit of Worcester Inc. we held an egg hunt in a section of Elm Park. We filled 200 eggs with candy and facts about the East-West Trail and Worcester's Parks and had over 40 members of Big Brother Big Sister take part in the hunt.

6. Backpack Mail

We sent a promotional flyer about the East-West Trail to nine elementary schools along the trail. In total 3,500 copies were sent to the nine schools for students to take home. Also, Mark Berthiaume, the Student Assignment Officer at the Worcester Parent

Information Center, sent an email containing the flyer to all 34 elementary school in Worcester.

7. Media Content Archive

Throughout this project we have collected many photographs and videos at the different green spaces throughout out Worcester. We have created an archive with all of the media we collected and organized the media based on the green space in which it was taken. We have also given the Park Spirit of Worcester Inc. a copy to use for further promotion of the trail.

Recommendations

Based on our research and awareness campaign, we compiled a list of recommendations to assist Park Spirit in accomplishing the goal of enhancing the overall trail experience for Worcester residents of all ages thereby increasing the utilization of the East-West Trail:

1. We recommend Park Spirit continue networking with Worcester’s various organizations and businesses.

Throughout the course of the project the team has established connections with Worcester’s Parks Department, Discover Central Massachusetts, Big Brother Big Sister of Worcester, and nine Worcester Public Elementary Schools, which are highlighted in Appendix 9. All of these organizations are interested in continuing to work with Park Spirit of Worcester Inc. on continuing to publicize and be a part of events hosted on the East-West Trail.

2. We recommend Park Spirit continue holding and creating trademark events along the East-West Trail

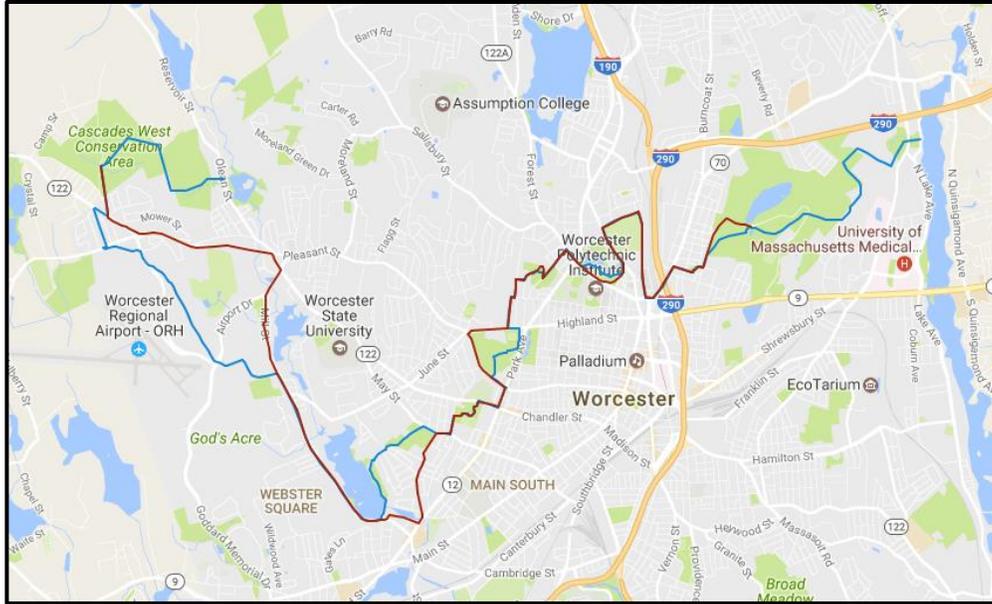
After the success of the egg hunt and the Earth Day Clean Up that Park Spirit holds we recommend Park Spirit continue holding these events annually and expanding their audience. An effective trademarking event will help build the foundation for the East-West Trail to become a household brand.

3. We recommend Park Spirit look into the development of a recognizable brand icon for the East-West Trail

The current logo for the East-West Trail is a successful trail marker but does not draw the attention to the bigger picture of what the East-West Trail is. We recommend that Park Spirit continue work on developing an identifiable logo.

4. We recommend Park Spirit consider the development of handicap version of the trail

Part of Park Spirit's goal is to enhance the trail experience for Worcester residents of all ages. Since the East-West Trail is an urban hiking trail that utilizes city streets and sidewalks it is possible for those with mobile restrictions to participate. Although those with mobile restrictions would not get the entire hiking experience, they can still benefit from the trail and green spaces. Therefore, we recommend that Park Spirit considers the development of a handicap version of the trail and upload a new Google Map to the web application.



6: The red trail is the proposed handicap trail and the blue is the East-West Trail

5. We recommend Park Spirit consider a revision of the Western Section of the East-West Trail

The mile and a quarter section along Mill Street is not only hard on the feet but also not aesthetically pleasing as it runs through the Worcester’s more commercial section. We recommend that Park Spirit seek an alternate route, potentially through God’s Acres, to reinvigorate this section of the East-West Trail.

6. We recommend Park Spirit use the media archive for weekly social media posts

Currently Park Spirit has social media outlets in Facebook, Instagram, and Twitter all of which can be connected to share and post the same media. We recommend that Park Spirit look into creating a weekly post across these forums that is unique to their purpose and encourages followers to go out and explore Worcester’s various green spaces.

If implemented, we believe the above recommendations will help Park Spirit develop a sustainable and successful brand and network for the East-West Trail. We hope the mobile application, Easter egg hunt and paper map will increase utilization of the East-West Trail and enhanced the experience for trail users.

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Chapter 1: Introduction

The United States is home to 59 national parks and 10,234 state parks that are predominantly located in the rural and suburban regions of the country, but what about the 200 million Americans living in one of the country's urban cities (Bureau U.C., 2015)? How can we bring this same immersive experience with Mother Nature to the nation's densely populated concrete jungles? The answer lays within urban green spaces according to Frederick Law Olmstead, the father of American Landscape Architecture (Young, 1995).

Of the 318.9 million people living in the United States of America in 2017, one in three adult males, one in three adult females, and one in six adolescent children are considered overweight or obese (Overweight and Obesity Statistics, 2012). Similarly one in three adult men, one in eight women, and one in six adolescent children in America are diagnosed with depression and other anxiety disorders (Facts and Statistics, 2016). There are roughly 100 million Americans suffering from these disorders and while there are many different methods for combating obesity and anxiety disorders some experts argue that nature is an effective antidote to such conditions (id). Nineteenth-century author and environmental philosopher John Muir urged Americans to

“Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop from you like the leaves of autumn” (Muir 1917).

A 2011 study conducted by award winning science writer and editor, Sarah Zielinski of The Smithsonian has found that in greener neighborhoods depression becomes less prevalent, children tend to weigh and gain less weight, and social vices such as thefts, burglaries, and arson become scarce as vegetation increases (Zielinski, 2011). Ms. Zielinski even found that office

buildings with a view of trees and other greenery reduced work related stresses and improved productivity among company employees (id).

A green space, as defined by PhD Robert Ryan, is any nature preserve, plaza, or cemetery found in an urban settings (Ryan, 2006). The city of Worcester, Massachusetts is a prime example of a thriving city with about 60 urban parks and trails (City parks, 2017). Worcester's green spaces are maintained by various volunteer nonprofit organizations such as the Friends of Newton Hill Club and the Greater Worcester Land Trust, most of which fall under the supervision of Park Spirit of Worcester Incorporation. Park spirit has ten members at its core and in 2015 implemented a unique urban hiking trail connecting 20 different green spaces over the span of 14 miles (Spirit, 2016).

The East-West Trail is the first of its kind for the city of Worcester, yet it remains widely unknown to the city's 180,000 residents, 10,000 of which are students enrolled in one of the nine colleges and universities located directly along the trail (Colleges and Universities, 2017). In order to increase awareness of this trail, Park Spirit reached out to Worcester Polytechnic Institute's Worcester Community Project Center. This report contains five chapters. In Chapter 2: Background we explore green spaces throughout the country and then narrow our scope down to greenspaces in Worcester, Massachusetts. In Chapter 3: Methodology, we describe the goal of this project and discuss how we used individual and focus group interviews, surveys, site observations, and case studies to accomplish five objectives and help Park Spirit reveal Worcester's hidden gem: The East-West Trail.

Chapter 2: Background

In this chapter we explore the development, benefits, and challenges of urban parks and trails. In section 2.0 we explore the development of parks and trails throughout the United States. Then in section 2.0.1 and 2.0.2 we explore the development of urban parks and the development of urban trails respectively. In section 2.1 we discuss the benefits of these green spaces. We focus on three benefits physical health, mental health and environmental. In section 2.2 we then discuss the challenges of having urban green spaces. Three main challenges we explore in detail are environmental, safety and maintenance. To conclude this chapter we narrow our scope of urban parks and trails from those throughout United States to just those within Worcester, Massachusetts in section 2.3. Also within section 2.3 we describe the history of Worcester, the development of Worcester's urban green spaces and finally, Worcester's present day parks and trails.

2.0 Parks and Trails in the United States of America

It is important to understand some of the culture and history behind the development of parks and trails. In this section, we explore the rich history of the formation of early American parks and their evolution into those we see in the present day of 2017.

In May of 1832 –during the height of the Manifest Destiny Era–, George Catlin a Pennsylvanian born artisan became concerned with the rapid settlement of lands without regard for preservation of natural forests. As a landscape painter he believed that the purpose of his work was “to capture the grace and beauty of nature before it was obliterated” (McCloskey, Gilligan, 1969: 68). Catlin was not the only person to share this belief; some people of note include Thomas Cole, Horace Greeley, Samuel Hammond and John Muir. Cole, author of the 1993 book, *Drawn to Nature*, that focused on the gradual disappearance of nature. Horace

Greeley, founder and editor of the New York Tribune, wanted, “[t]o spare, preserve, and cherish some portion of your primitive forests; for when these are cut away I apprehend they will not easily be replaced.” Sammuel Hammond, was the first to advocate preservation of the Adirondack Mountains; and John Muir, a Scottish native who petitioned Congress to protect the Yosemite region in California. Each contributed to the call for natural preservation in America during the nineteenth century (Noble, 1964).

Unfortunately for Catlin, he would not live to see his vision come to fruition as he passed away before the founding of the first national park on March 1st, 1872 in Wyoming. The park is named Yellowstone National Park and is roughly 2 million acres in Northwestern Wyoming. The birth of Yellowstone came by the pen of then President Ulysses S. Grant when he signed the Yellowstone National Park Preservation Act. While this was the first ever national park in the United States of America, it was not the first existence of parks within the country. Prior to the establishment of Yellowstone the word park itself was not defined, as Robert Ryan believes, as a public green space such as nature preserves, plazas and cemeteries, (Ryan, 2006) but rather a park was seen as synonymous with a garden (Nash, 1970). Unlike its predecessors Yellowstone National Park was not meant to be just another garden, but in the eyes of President Grant a display of raw nature (Nash, 1970). This display of raw nature can also be found in urban settings with the development of urban parks in the early 19th century.

2.0.1 Urban Parks

Robert Ryan, Professor of landscape architecture at the University of Massachusetts, defines an urban park as any green space, plaza, or cemetery located in a city. However, this is not always the case. According to Terrance Young, associate professor of geography at California State Polytechnic University, in the United States during the latter 19th century the development of urban parks was modeled after European urban parks in order to: give people a

unique experience with nature, foster democratic ideology, have a sizeable amount of underdeveloped land; and to appease the American population (Young, 1995). The designers of these early green spaces, –largely upper class elites– believed that many of the problems within society did not arise because people are evil but rather because they were out of touch with external nature. The vices that early park creators sought to eradicate from American urban cities included poor health, poverty, crime, etc. each of which could be rectified through successful implementation of green spaces (id).

In the 1850's, according to Frederick Law Olmstead, parks should consist of large green spaces with one type of dull plant species -as the use of colorful plants was highly discouraged- and be linked together by repetition of earth and water, as illustrated in Figure 1 (Olmstead & Nolan Jr., 1906).



<https://www.pinterest.com/gregkaeper/masterplans/>
Figure 1. Romantic Approach to Urban Park Design¹

These parks also possessed curvilinear paths and completely isolated visitors through privacy hedges and trees (Olmstead & Nolan Jr., 1906). There were no games to be played here

as all boisterous activities were prohibited and until the 1880s park designers' target audience was the working class man, as their health was believed to have suffered most. Women and children were only mentioned in brief discussions about the safety of escorted and unescorted women and their children while walking through the park (Young, 1995).

This method of urban park design is often classified as the Romantic approach and is accredited to New England journalist Frederick Law Olmstead. Immortalized as the “father of American landscape architecture” Olmstead believed that, “[a]fter immersion [in a park] visitors are supposed to be refreshed and braced for another round of commercial activity” (Olmstead & Nolen Jr., 1906). Some prime examples of the Romantic approach that are still evident today are the Golden Gate Park in California and Central Park in New York. Although both have been modified since they first opened, one can still see the antiquated remnants of Olmstead's work in 2017. Yet the romantic approach was fairly short-lived for by the mid nineteenth century landscape architects began moving towards a new approach that would be more inclusive to the community it serves. This new method of urban park design came to be known as the Rationalistic approach, a style created from social reformers who were part of a movement of positive environmentalists (Boyer, 1978).

Under the Rationalistic method urban parks were beautified with rainbow carpet beds of flowers and a reduction in privacy hedges and trees. Rationalistic advocates believed the reduction of hedges and trees would make visitors appreciate their green space more as they were able to see parts of the city that surrounded the park. Rationalistic parks leaned away from curvilinear paths and more towards linear paths and trails making it easier for people to navigate them (Young, 1995). The Rationalistic approach soon began taking into consideration more than just the safety for women and children; in 1887, the construction of the first ever playground, in

the Golden Gate Bridge Park, began. From there recreation centers and athletic training fields were included in urban park design. After a little less than a half a century urban parks were specially segmented to provide flowerbeds, music concerts, dance halls, picnic grounds, tennis courts, archery fields, horseshoe pits, a swimming pool, a playground, a recreation center with ball fields, and bicycle paths (id), as seen in Figure 2.



Figure 2. Rationalistic Approach to Urban Park Design²

While this new method of park design brought many benefits to those living in urban American cities they were not perfect.

2.0.2 Urban Trails

Urban trails were built to connect these Rationalistic parks. The city of Austin, Texas uses the 2009 Bicycle Master Plan definition of an urban trail which defines an urban trail as “a citywide network of non-motorized, multi-use pathways that are used by bicyclists, walkers and runners for both transportation and recreation purposes” (City of Austin, 2014). These trails are designed for various modes of transportation as well as recreational activities (Reynolds et al.,

2006; id). Urban trails use the existing city landscape to form the trail therefore no two urban trails are uniform. These trails are designed this way out of practicality and helps to keep costs low, minimize construction, and make use of existing pathways that residents already commonly use (City of Austin, 2014).

Urban trails are constructed out of various materials including asphalt, concrete, stepping stones, pebbles, dirt and grass. The wide range of materials is due to the fact that urban trails are meant to connect various elements of the city, meaning some parts of the trail may be on city sidewalks and roads or it may go through wooded areas and parks (Reynolds et al., 2006). These trails are meant to provide leisure, recreation, access to urban greenspaces as well as a safe and efficient means of transport for city residents.

2.1 The Benefits of Urban Green Spaces

2.1.1 Physical Health

Physical activity has been proven to lower the risk of heart disease, type 2 diabetes, colon cancer, osteoarthritis, and osteoporosis (Brownson, Housemann, Brown, Jackson-Thompson, King, Malone, & Sallis, 2000). Access to green space for physical activity can help residents fight these troubling health issues (Lachowycz, & Jones, 2011). Obesity is one epidemic that we will focus on in this section due to the fact that it is most prevalent epidemics.

Obesity

The epidemic of obesity has become more prevalent in the modern world, especially in the United States (Caballero, 2007). A study conducted in 2003-2004 by obesity experts concluded that 32.2% of adults in the United States were obese (Ogden, Carroll, & Curtin, 2006). Research has shown, see Figure 3 below, that this may be a result of the environment people live in, not necessarily the practice of poor health (Lachowycz, & Jones, 2011). An important factor contributing to unhealthy environments is the lack of accessible green space for physical activity

(Bedimo-Rung, Mowen, Cohen, 2005). Lachowycz and Jones (2011) examined 13 studies (12 from North America and 1 from Europe) about the effect of accessible green space and reported BMI (Body Mass Index). The overarching conclusion from these studies was that there is a correlation between access to green space and the lowering of BMI (Figure 3) (Lachowycz, & Jones, 2011).

Outcome	Relationship between greenspace and health			
	Positive	Equivocal	None	Negative
Physical Activity				
Objective	3	2	4	0
Subjective	17	11	11	2
Weight status				
Objective	2	3	2	0
Subjective	1	3	2	0
Obesity-related health outcomes	2	1	0	0

Figure 3. Count of academic papers by strength of the relationship of green space and obesity related health indicators, by outcome measured and population age group.

2.1.2 Mental Health

Green spaces are believed to benefit a person’s mental health, although there has not been a lot of numerical data presented on it, researchers are working to find a correlation between the two. According to Dr. Jo Barton, a doctor from the Department of Biological Sciences at the University of Essex, a healthy mental state is a “state of well-being in which the individual realizes his or her own abilities, can cope with normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (Barton, Griffin, & Pretty 2012: 1). The two most common threats to mental health are depression and anxiety. The National Alliance on Mental Illness, a grassroots mental health organization, reported that, as of 2015, one in every five adults in the United States experience mental illness annually (National

Alliance of Mental Illness). Specifically in 2015 alone, 6.9% of adults in the United States had a major depressive episode and 18.1% experienced an anxiety disorder (National Alliance of Mental Illness). Mental illness is prevalent in the United States and doctors and researchers are exploring the power of nature to heal these illnesses.

This belief in the healing power of nature dates back to the middle ages when green spaces were built outside of hospitals (Bratman, Hamilton, & Daily, 2012). Today instead of creating green spaces outside of infirmaries, doctors, in some cases are prescribing patients to visit green spaces in place of being admitted to hospitals. In Sweden, Nature-Based Rehabilitation, the use of green spaces (gardens, trails, parks) to treat mental disorders, is being used to increase participants' mental health (Sahlin, Ahlborg, Tenenbaum, & Grahn, 2015). In 2012 a case study of 57 patients completed by a Swedish University, the effect of Nature-Based Rehabilitation on people who suffered from burnout, depression, and anxiety was examined. This study showed that Nature-Based Rehabilitation significantly decreased the feelings of depression, burnout, and anxiety over the course of one year (id).

Another medical movement occurring in the United States is the Exercise is Medicine initiative. In 2007 this initiative gained traction by partnering with the American Medical Association as well as the American College of Sports Medicine, to treat mental illnesses with exercise (Maier & Jette, 2016). Engagement in physical activity is beneficial to one's physical health, as well as their mental health. Dr. Barton's case study containing 53 individuals with mental illnesses showed that nature based exercise decreased symptoms of the illnesses (Barton, Griffin, & Pretty, 2012) Furthermore, the individuals who partook in this study associated feelings of happiness and joyfulness with walking outdoors; whereas walking indoors led to an increase in frustration, anxiety, and sadness within these individuals (id).

2.1.3 Environmental

A 1996 United Nations study estimated that by 2030, 60% of the world population will live in cities (Bolund, & Hunhammar, 1999). Jorge E. Hardoy, Diana Mitlin, and David Satterthwaite, authors of *Environmental Problem in an Urbanizing World*, concluded that the two of the most major environmental issues in urban areas are air pollution and climate change (Hardoy, Mitlin, & Satterthwaite, 2012). In this section we delve into how urban green space, specifically parks and trails, can combat these environmental stressors.

Air pollution is generally caused by transportation and heating of buildings, because of this there is no surprise that it is a major issue in urban areas (Bolund, Hunhammar, 1999).

According to environmental researcher Aloys Bernatzky, air pollution can be combated by green space; in a study he found that 80% of air pollutants in parks are filtered out by green space (Bernatzky, 1983). Additionally environmental conservation experts Francisco J. Escobedo, Timm Kroeger, and John E. Wagner have discovered a positive correlation between lack of green space and air pollution (Escobedo, Kroeger, & Wagner, 2011). The natural air filtration properties of trees and other vegetation are largely why this phenomenon occurs. (Bolund, Hunhammar, 1999).

Climate change has become one of the major worldwide environmental issues today. There is solid evidence that suggests climate change is the primary contributor to worldwide issues such as: warming of climate, sea level rising, and interference of the atmosphere (Cicerone, & Nurse, 2014). According to researchers Dr. Ralph J. Cicerone and Sir Paul Nurse, the main cause of climate change is greenhouse gasses (id). Since the industrial revolution our atmosphere has seen a dramatic increase in these harmful gasses (Watson, Rodhe, Oeschger, & Siegenthaler, 1990). Since urban areas have a high concentration of industry, these areas may struggle with climate change.

Green infrastructure can reduce the effects of climate change. Studies, conducted by climate experts have shown that air temperatures in parks are significantly cooler than non-green sites, specifically .94 degrees C (Bowler, Ali-Buyung, Knight, & Pullin, 2010). The reason this phenomena may occur could simply be extra shading from vegetation such as trees and shrubs (Escobedo, Kroeger, & Wagner, 2011). Bowler, Ali-Buyung, and Pullin have also suggested that vegetation actually has the ability to take hazardous carbon emissions directly out of the environment (Bowler, Ali-Buyung, Knight, & Pullin, 2010).

2.2 The Challenges of Urban Green Spaces

2.2.1 Environmental

It is true that urban green spaces have numerous positive environmental impacts, however in some cases green space can have detrimental effects on the urban ecosystem.

The degradation of hiking trails may have severe negative environmental impacts (Leung, & Marion, 1996). Trail degradation mainly occurs in three ways: 1) concentrating traffic on one route; 2) providing recreational events on attractive trail routes; and 3) organizing recreational activity by establishing transportation lines (Leung, & Marion, 1996). The effects of these activities can vary, yet are tangible in physical, ecological, and aesthetic ways (Leung, & Marion, 1996). Specifically littering not only contributes to ecological and aesthetic issues but can also correlates to an increase in crime rates (McCormick & Holland, 2015).

2.2.2 Safety

Most of the time parks in an urban area are amenities, although occasionally urban parks become a disamenity. The surrounding environment can be negatively affected by a park because the fear of crime, crime itself, and traffic (Iqbal, 2015 & Sreetheran & van den Bosch, Cecil C. Konijnendijk, 2014). Nicholson-Lord, an environmental writer, observed that littering along with social and crime problems in urban parks have led to many people considering public parks to be

a negative asset (Madge, 1997; McCormick & Holland, 2015). With increasing negative qualities in parks, it is important to address crime and traffic in order to maintain the safety of park goers as well as members of the community.

The prevalence of crime in many urban parks has made residents wary of enjoying the benefits of them. In the field of criminology, fear of crime is a leading research topic (Sreetheran & van den Bosch, Cecil C. Konijnendijk, 2014). Fear is defined as the “unpleasant emotional state triggered by the perception of threatening stimuli” (id). Forty-three percent of all respondents rated fear as “very important” when asking why they did not use urban parks (Madge, 1997). Furthermore, seventy-three percent of all women who completed the survey stated fear as the reason for not going to urban parks (id).

Unfortunately, residents’ may have a reason to be afraid, the Wall Street Journal investigated the urban parks in New York City and how they relate to crimes. In 2016, major crimes, such as rapes, aggravated assaults and murders have increased within these urban green spaces (Morales & Kanno-Youngs, 2016). In fact, these crimes have risen 23% compared to the same time period last year. Parks with high crime rates increase the level of fear of crime as well decrease the public’s desire to use them.

There are ways to facilitate continued usage of parks and decrease the fear of crime. Cecil Konijnendijk, conducted research on peoples’ perceptions of parks and crime rates and found that having proper lighting for entrances and secluded sections of parks have been proven to reduce the feeling of fear in park goers (Iqbal, 2015; Sreetheran & van den Bosch, Cecil C. Konijnendijk, 2014; McCormick & Holland, 2015). Another method is to increase park personnel and security around and in the parks, as well as increase community awareness of the park (Sreetheran & van den Bosch, Cecil C. Konijnendijk, 2014).

Multiuse urban trails make use of city streets and sidewalks thereby expanding our definition of safety to include pedestrian and vehicular traffic (Hankey, Lindsey, Hoff, & Wang, 2014). An increase of both pedestrians and vehicles elevates the risk of pedestrian accidents (Campbell, Zegeer, Huang, & Cynecki, 2004). One main type of pedestrian accidents are those that occur with children ages zero to nine. A study found that the majority of parents overestimate their children's ability to cross the street; thus making it more likely for a child to be involved in an accident (id). Another factor that plays a role in number of pedestrian accidents is the number and type of mechanisms that aid in prevention of these accidents. Examples of the type of mechanisms include streetlights, cross walks and stop signs.

In a study completed by the U.S. Department of Transportation, 74 percent of pedestrian accidents occurred when there were no traffic control signals such as stop signs or speed bumps (Campbell, Zegeer, Huang, & Cynecki, 2004). The study also found that most of the fatal pedestrian accidents occurred at night; while proper lighting at night significantly reduced the pedestrian risk of an accident (id). Furthermore if a crosswalk was set up to stop traffic in all directions before signaling for the pedestrian to cross the street there were fifty percent less pedestrian accidents that occurred in crosswalks compared to crosswalks that only stopped traffic in one direction (id). Implementation for traffic safety on trails and in parks will cost money from residents and the city but will increase the safety for users of these green spaces.

2.2.3 Maintenance

In order for these urban green spaces to remain attractive for use, they must be properly marked and maintained. According to a study done in Hong Kong (Alex Lo, 2010), community usage of green spaces is correlated to the public opinion of the said green space. The major factors influencing green space usage were primarily trash and trail conditions; both of which are

costly services to maintain. Trash pick-up along the trail, if not done by local community groups or residents, would require city-funded trash pickup (R. Miller, personal communication, February 1st, 2017). The greenery of the parks and trails must also be kept alive and well groomed to keep them looking healthy and prevent them from interfering with trail activities. Fresh Pond Reservation in Cambridge, Massachusetts have outlined a long-term trail maintenance strategy they hope to employ to tackle trail erosion (Lederer, 2008). One way of tackling trail erosion is to use paved trails but those too bear the costs of repairing cracks and potholes. These costs tend to be expensive as machines and resources for recreational trails are scarce. Repairing and preventing trail erosion is equally expensive; the city was recommended to replace nearby invasive vegetation with native plants or dig repair gullies to facilitate draining. These costs are necessary to keep the trail operational and safe for those who use it.

2.3 Worcester, Massachusetts

2.3.1 A Brief History of Worcester

The town of Worcester was first settled by the English on April 2nd in 1731 and because of its location within what would later become the state of Massachusetts it was referred to as the center of the commonwealth. One hundred and seven years later the town's population increased exponentially and it was incorporated, making it one of the most prosperous cities in early America. Having a population of 85,000 residents Worcester soon became the one of the largest cities in Massachusetts, second only to Boston (Meyer, 2005). The city itself was a hills city that developed into geographic segregation of the classes. The more affluent families tended to live amongst the higher elevations whereas the middle to lower class families lived at the lower end of the hills. In Figure 4 we can see an overview of what the city looked like at this time having a radius of 25 miles long.

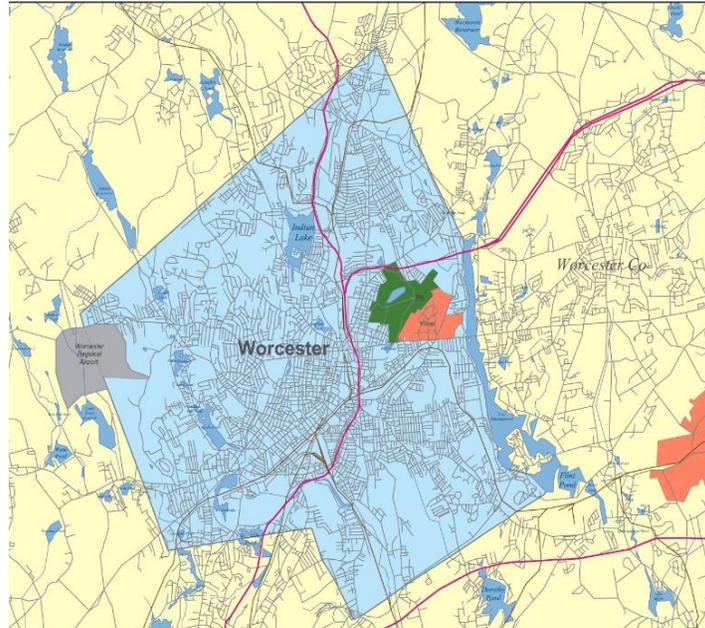


Figure 4. Geographic representation of the city of Worcester.

Although landlocked, Worcester became an ideal place for immigrants due in part to the many iron works factories it housed. These factories not only provided thousands of jobs but also required a large population to fill these positions. A primary concern of factory owners was the middle class urban dweller whose frayed body could be refreshed and renewed by the contemplation of a carefully crafted landscape because of the labor-intensive workday for the average laborer (Rosenzweig, 1979). Owners began seeking out methods to create an urban refuge to appease their workforce and more importantly to maintain the masses. They soon found their solution in developing urban parks (id).

2.3.2 The Development of Urban Parks in Worcester

The earliest parks in the city of Worcester were not exactly what one would consider a park. Most parks were developed on land that neither the industrial monarchs nor the affluent families deemed feasible for commercial use (Rosenzweig, 1979). Many of the early parks were built upon hilly land that was not exactly prime real estate. They were also located in areas that were not considered the safest during the latter nineteenth-century and were not easily accessible

to those of low-income (id). It was not until the invention of the electric trolley in 1891 that some of these green spaces became accessible but they still were unappealing to the public (Meyer, 2005).

Edward Lincoln was the first secretary and chairman of Worcester Parks and remained in that position until 1896, almost twenty years later. Lincoln was among the political elite in Worcester during his time in office and believed in Frederick Olmstead's Romantic approach to park design (Meyer, 2005). However, when Lincoln first came into office the only viable green space in Worcester was a mere 28 acres by the name of Elm Park. Elm Park was primarily a dumping ground for municipal construction and a breeding ground for many unappealing social vices, but that did not deter Lincoln from turning Elm Park into his crowning achievement (id). He immediately placed a ban on circuses, littering, and almost banned all athletic activity but decided to hold on to baseball. Lincoln turned Elm Park around for the better but began running into altercations with the city's middle and lower class residents (id). During the remainder of Lincoln's time as Park chairman his sole contribution towards the East side was the acquisition of Newton Hill, but he failed to provide an urban refuge that would benefit both the West and East sides of Worcester as a resource for the public (Jackson, 1972).

2.3.3 Worcester's Parks and Trails

In 2017, much of the responsibility in maintaining the parks in Worcester falls on the city along with various local nonprofit organizations. Friends of Newton Hill, The Greater Worcester Land Trust, and Green Hill Neighborhood Association are but a few of the organizations that collaborate with Park Spirit of Worcester (R. Miller, personal communication, February 1st, 2017). Park spirit was originally created by the city hall of Worcester to act as the financial and physical custodian of the aforementioned organizations. However since its formation it has

become independent of city hall and provided much needed structure to an entirely volunteer based organization. At its core Park Spirit is comprised of ten volunteers, but with all those under its umbrella it reaches about 100 people in total (id). Some of their most recent accomplishments are the complete rebranding of Newton Hill Park, which now houses an 18-hole disc golf course, a 12-stage fitness program, concerts, and various 5k races for charitable organizations (id).

Worcester has over 60 parks and green spaces throughout the city covering over one thousand acres of land (City parks, 2017). Rick Miller and Colin Novick, Executive Director of the Greater Worcester Land Trust, began planning the concept of an urban trail in 2001 in order to connect all of these green spaces. By 2014 they completed a map of the 14 trail and a year later Park Spirit began allocating funds for the project known as the East-West Trail (Spirit, 2016). The trail spans the entire city starting in the Cascades and ending at Lake Quinsigamond; see Figure 5- for a map of the trail.



<http://www.telearam.com/entertainmentlife/20161005/new-east-west-trail-connects-worcesters-green-spaces>
 Figure 5. Map of Worcester's East-West Trail

The trail includes many important parks including Elm Park, Salisbury Park, Green Hill Park and God’s Acres. Elm Park is one of the oldest parks in Worcester (Spirit, 2016). Worcester put \$1.9 million into upgrades at the park including new playground equipment, bridges and improved lighting (id). Salisbury Park is another historical park housing Bancroft Towers. This tower is one hundred and seventeen years old (as of 2017) and was built in dedication to George Bancroft, a Worcester native and former Secretary of the Navy, politician, and writer (City parks, 2017). Green Hill Park was developed by Andrew Green, commissioner of New York’s Central Park in 1848, and is the largest municipal park in Worcester (id). God’s Acre is a unique park as its original owner was a religious fanatic that believed the land had certain spiritual properties (Boudillion, 2007).

Park	Size (Acres)	Year Established	Special Attributes
Elm Park	60	1854	Playgrounds Pond Concerts Thursday Nights (during the summer)
Salisbury Park	11.8	1912	Bancroft Towers – open to the public every Sunday for one month of the year
Green Hill Park	482.4	1903	Playing Fields Golf Course Two Ponds Petting Zoo
God’s Acres	10	1800	Deed’s Rock Rural Hiking Grounds, Alleged Paranormal Activity

Figure 6. Important Parks to Note

Goal for East - West Trail

At just three year olds having minimal signage and low social media presence, the East-West Trail, spanning 14 miles across Worcester, comprised of 20 green spaces, remains widely unknown amongst Worcester’s residents. Park Spirit social media such as Facebook on average

reaches 100 people and their website is under renovations. Currently Park Spirit has no efficient methods of measuring the usage of the East-West trail other than the turnout of the few events they host on the trail. In three sessions of guided hikes along the portions of the trail the turnout was only thirty people (Spirit, 2016). The lack of community awareness has led to the trail being hidden in the heart of the city for the past three years. In the next chapter, Chapter 3 we discuss our methodological approach to helping Park Spirit reveal the hidden gem known as the East-West Trail.

Chapter 3: Methodology

3.0 The Goal of the Park Spirit Interactive Qualifying Project

To work with the Park Spirit Of Worcester Inc. to enhance the overall trail experience for Worcester residents of all ages thereby increasing utilization of the East-West Trail.

In our preliminary meeting with the Park Spirit of Worcester Inc., both their treasurer, Rick Miller, and their president, Brittany Legasey, expressed interest in the development of a mobile application for the East-West Trail. They wanted an application with GPS capability, points of interest along the trail, and a feedback section. The trail itself is the first urban hiking trail in the city of Worcester and at 14 miles long it spans roughly 20 green spaces along with many of the city's landmarks. However upon further conversation with Mr. Miller and Ms. Legasey, we found the primary issue with the trail is that it is widely unknown to the Worcester residents. To achieve this goal we focused on the following objectives:

1. Assess what Worcester residents want in green spaces
2. Estimate Worcester residents' awareness of the East-West trail
3. Compile an inventory of points of interest along the East-West trail
4. Assess the current conditions of the green spaces that comprise the East-West Trail
5. Determine the most appropriate technology to enhance trail user's experience.
6. Develop an interactive electronic mobile experience for trail users
7. Develop sustainable ways for Park Spirit to successfully market the East - West Trail

3.1 Objectives

Objective 1: Assess what Worcester residents want in green spaces.

In order to determine what members of the community felt was important in regards to green spaces, we facilitated a focus group, conducted interviews, and administered surveys.

To begin, we conducted our focus group containing five members of the Park Spirit of Worcester Inc. who have worked closely with the community and are the most familiar with the trail. This focus group was conducted inside of treasure Rick Miller's home as it allowed the president of Park Spirit, Brittany Legasey, Ruth Seward, Bob Locke, and Greg Droerschler, and all four members of our team to join. We chose a focus group and interviews because they can lead to an in depth understanding of attitudes, motivations, and perspective (Edmunds, 1999). Although the focus group was not representative of the entire target population, it produced information that we could explore more in depth during interviews. See Appendix 1. for our focus group questions.

We conducted semi-structured interviews with Purvi Shah, Worcester Polytechnic Institute Associate Professor of Business and Marketing (see Appendix 2 for interview questions); Rob Antonelli, Assistant Commissioner of the Parks Department in Worcester (see Appendix 3 for interview questions); and Christina Andreoli, President of Discover Central Massachusetts (see Appendix 4 for interview questions). The benefits of conducting semi-structured interviews are that they allow the interviewee to think deeper about social and personal issues, they only take 15 to 30 minutes, and allow for a variety of answers (DiCiccio-Bloom & Crabtree, 2006). A main goal of these interviews was building rapport with the interviewee. We built rapport by making the opening question of the interview easy to answer and engaging to make the interviewee feel at ease. Once rapport was built, the interviewee was more likely to report their actual feelings, opinions, and facts when answering the questions (id).

We collected data on what the community is looking for from the parks and trails through the interviews with Rob Antonelli and Christina Andreoli. Based on the responses to the questions, we created more in-depth survey questions. Surveys are less time consuming than

interviews and allowed us to gather more data on specific questions (Rea & Parker, 2014). Furthermore, surveys are easily repeatable; therefore we were able to conduct the same survey with multiple different people throughout the city.

We distributed the survey to college students from Clark University, Worcester Polytechnic Institute, Worcester State University, and Assumption College as well as the Parks Department of Worcester and the Chamber of Commerce. In order to get the views of other college students, other than those from Worcester Polytechnic Institute, we had a student from each of the colleges place the survey on their university's social media pages. We placed our survey in the "Your Probably from Worcester, MA if ____" Facebook page which has over 20,000 followers in order to get a significant amount of data points from age groups other than 18-25 years old. We developed the survey questions using the data we collected from our interviews see Appendix 5 to review sample survey questions. We used the data collected from the survey to determine the different components that resident's addressed about their park and trail experience.

Objective 2: Estimate Worcester residents' awareness of the East-West trail

Worcester, Massachusetts has over 180,000 people and an additional 10,000 college students. We used the survey from Objective 1 to determine the current community awareness of the East-West Trail amongst city residents.

Members of the Park Spirit of Worcester Inc. knew the trail was mostly unknown but they did not have the time or resources to measure this data. Using the survey we collected data on an individual's age and if the individual knew about the East-West Trail. The team utilized this information when planning the rebranding of the trail.

The survey and interviews helped gauge if city residents knew about the trail and used it. We compared our data on whether the age of the respondent influenced whether or not the individual knew about the trail or used it. We also took into consideration the total percentage of people from our survey that had never heard of the trail.

Objective 3: Compile an inventory of points of interest along the East-West trail

There are numerous businesses, community organizations, facilities, landmarks, and other points of interest along the East-West Trail that trail users may not know are in close proximity to the East-West Trail. We assessed all 14 miles of the trail to develop a comprehensive inventory of such points of interest. We used the information we gathered from previous interviews and surveys as well as participant observation along the trail to generate a list of criteria for assessment of the green spaces, view Appendix 6. We looked at historical sites, restaurants, and other amenities such as parking, bathrooms and accessibility for each of the points of interest. We chose these categories because of how they were ranked by survey respondents, member of Park Spirit Board and their proximity to the trail. Participatory observations and the use of Google Earth were the best methods for finding the points of interest along the trail as it allowed our team to understand the situation from the perspective of a trail user as well as an overview of the entire area around the trail. We were better able to understand the complexities of the trail, and how current trail design may be affecting user knowledge or access through our participatory observations. Information that we recorded from driving and walking sections of the trail near each point of interest includes:

- Nearest park or trail
- On-site photograph of location
- Point of Interest's Identity (Business, Landmark etc.)
- GPS coordinates (For future project developments)

We used Google Maps to keep track of a point of interest's location relative to the trail. This information was incorporated into the web application with full descriptions and hot links to other websites for further learning.

Objective 4: Assess the current conditions of the green spaces that comprise the East-West Trail

Since the East-West Trail's implementation in 2014, according to Ms. Legasey, most of its serious development has only occurred in 2015 and 2016. While the trail itself is fairly young at three years old many of its components date back to the nineteenth century. We took this into consideration when the team decided that it is necessary to conduct field studies and site observations on the 20 green spaces that comprise the trail, in order to collect the following data:

- What is the current physical condition of the trail?
- How accessible is the trail?
- Are there accessible restrooms?
- What activities are the parks made for?

For assessing the current physical conditions of each component of the East-West Trail we explored the type of pathways and if there was efficient trash receptacles. We determined if there was paved, concrete, pebble, stepping stones, or dirt and grass trails for each of the green spaces. We then rated on a scale of 1-5, 5 being the best and 1 being there worst, the efficiency of the trash receptacles. A score of 1 was received when there was trash throughout the park and no trash receptacles to put the trash. A score of 5 was received when there was minimal trash in the park and numerous trash receptacles throughout the park. While evaluating the physical conditions we made note of the type of activities that could occur in the park. For example if

there were rectangular fields that could be used for soccer, football and lacrosse, or baseball fields and tennis courts, as well as playgrounds, benches and picnic tables.

Ease of accessibility is another important factor in determining the success of an urban hiking trail. For the purpose of this project we used John Hultsman's definition of accessibility that expands the term to not only users with disabilities but also to signage as well (Hultsman, 1996). Adequate signage at trail heads and trail ends as well throughout the trail are pivotal as a user of the trail would be able to know that they are still on the trail. Having adequate signage can also impact the accessibility of a trail because if users do not know where parts of the trail begin, end, or where certain commodities such as restrooms, parking lots, and recreation centers are located then users may become confused, lost, or disgruntled resulting in a negative trail experience.

Continuing off of the assessment of the physical conditions of the type of trail, we determined whether the trail was accessible for wheelchairs and strollers. We not only took into account if the trail was grass, pebble, pavement etc. but also the elevation of the trail. As mentioned in Chapter 2, Worcester is very hilly which would hinder one in a wheelchair or pushing a stroller's accessibility.

The other aspect of accessibility is efficient signage. We used the scale of 1-5, like we did for efficient trash receptacles, to rate the signage in each park. The signage we were looking at were trail markers (for trails other than the East-West Trail, due to the fact that we know the East-West Trail has inefficient signage), park entrance signs, maps, and signs that had other information for the parks on them (no dogs, restrooms, do not feed birds etc.). We gave scores of a 5 to parks that had entrance signs, a sign with a map, signage throughout trails so one did not

feel lost, and had at least one sign with other information on it. A park got a score of 1 if there was no signs and one felt lost while in the park.

Objective 5: Determine the most appropriate technology to enhance trail user’s experience

There are thousands of technological resources available in 2017. In order to determine which of these resources was best suited to satisfy the needs of Worcester residents, addressed in objective one, we compared the advantages and disadvantages of each. Based on the information collected from our focus group of the Park Spirit of Worcester Inc. and the survey of the general public we developed a list of components that residents and Park Spirit Board Members found necessary for inclusion in the mobile trail experience. These components included GPS, a feedback section, points of interest, and historical places. The team researched possible technological resources such as an interactive PDF, QR codes, creating a mobile application from scratch, using a mobile application builder, and a mobile web application. The cost, GPS tracking capabilities, feedback section and ability to display points of interest were taken into consideration when making the pro – con lists. We also took the public’s opinion into consideration when analyzing each technological resource.

Technological Resource	Cost	Public Opinion	GPS Tracking	Feedback Section	Points of Interest
Interactive PDF	\$20 / month	Good	No	No	Yes
Creating App from Scratch	\$200 / month	Good	Yes	Yes	Yes
QR Codes	Free	Poor	Yes	Yes	Yes
Appypie	\$300 / year	Poor	Yes	Yes	Yes
Google Maps / Web App	Free	Good	Yes	Yes	Yes

Figure 7: Analysis of technological resources.

Objective 6: Develop an interactive electronic mobile experience for trail users

After comparing multiple platforms, we deemed combining both Google Maps and a web app the best option for our project. Using Adobe Muse we created a mobile web application that encompassed an interactive map from Google Maps. The Google Map was embedded in the mobile web app and displayed the entire trail as well as pins of different points of interest. Three different layers were created on the map: the first layer displayed the pins of restaurants, the second layer displayed the pins for amenities such as parking and bathrooms, the final layer displayed the pins for historical points of interest. Each of these pins will contain a brief description of the place with a hot link to a more detailed description on a different page within our web app. These more descriptive pages also contain a hot link to Discover Central Massachusetts website which also hosts pages of these points of interest. We included the hotlink to their web page after the president, Christina Andreoli, requested that we work with her to create a centralized location for this information. Discover Central Massachusetts spends a considerable amount of money on web search optimization therefore connecting our web app with their website is a perfect networking opportunity for Park Spirit.

We piloted our web app when we went out to the trail for Objectives 3 & 4. This was the first step in assessing the usability and uncovering shortcomings of the web app which included more accurate trail mapping. Next we shared the web app's URL with Worcester area college students to have them test it out. We sought their feedback and worked to address any issues they brought up.

Objective 7: Develop sustainable ways for Park Spirit to successfully market the East - West Trail

We wanted to leave Park Spirit with multiple ways to continue to market the East-West Trail. We created a brochure to go along with the web app, therefore people who do not want to

use a mobile device on the trail can use the brochure. The brochure contains a map with enlarged images of four of the parks along the trail. On the back flap we placed information about the trail, see Appendix 7 for the brochure.

Due to the time frame our project took place, we created an Easter event in Elm Park with Big Brother Big Sister that was hosted by Park Spirit. We contacted Big Brother Big Sister of Elm Park Community School in Worcester to coordinate an Easter egg hunt, where each big-little pair would be able to collect ten eggs. Each egg contained candy along with a fact about the East-West Trail and Worcester parks in general, see Appendix 8 for the list of facts that were placed in the eggs.

Next we created a flyer for backpack mail. Backpack mail is usually done in elementary school, where a flyer is given to a student to bring home to their parents. We contacted Mark Berthiaume, the Student Assignment Officer at the Worcester Parent Information Center. We obtained a list of the number of people enrolled at each elementary school in Worcester, see Appendix 9. We chose to only send it to the schools that were closer to the trail that Mr. Berthiaume recommended (these schools are highlighted in Appendix 9). In total we sent out 3,500 flyers to these students to take home. In chapter 4 we discuss what we found while executing these objectives.

Chapter 4: The East-West Trail Awareness Campaign

Early in our research, **we found that Worcester residents are not aware of the East-West Trail's existence.** Both members of the Park Spirit of Worcester Inc. and respondents of our survey demonstrated a lack of awareness of Worcester's 14 mile long hiking trail. All of the five focus group participants, members of Park Spirit, conveyed that the East-West Trail was underutilized due in part to lack of awareness by the Worcester residents. This conclusion was supported later by our survey results. Of the 343 survey responses we had to the question "Have you ever heard of the East – West Trail?" 267 respondents answered "No, I have never heard of it.", which is about 78% of all responses. Furthermore out of the 76 respondents who had heard of the trail only 22 had used it. As a result, throughout the project we worked to develop tools so the Park Spirit Organization could increase awareness of the East-West Trail.

Using the data we collected from our focus groups, interviews, and survey we were able to generate seven components of an awareness raising campaign for the Park Spirit of Worcester Inc. and the East-West Trail. Included in the campaign is an expansion and population of the Park Spirit website, the development of a mobile web application, a trifold brochure, a promotional video advertisement, an annual egg hunt, a flyer for backpack mail, and an archive of graphic content for social media and methods of publicizing the trail.

4.1 Expansion of the Park Spirit Website

The Park Spirit of Worcester Inc. currently hosts their website through the software Adobe Muse (B. Legasey, personal communication, March, 24 2017). Muse is a user friendly website building program that enables a user to construct a functioning website without having to write a single line of code. Prior to the student researchers involvement, the Park Spirit website consisted of five main pages: "Home", "About Us", "The East-West Trail", "Bancroft Tower",

and “Worcester’s Parks” along with respective daughter pages with information about meeting times, concert events, and biography pages on 50 green spaces. We have since expanded the website’s main pages to include a “Contact Us” page. This page enables web users to complete a feedback and suggestions form that can provide the Park Spirit with knowledge of areas that need improvement and a community service event request form as well, see Figure 8.

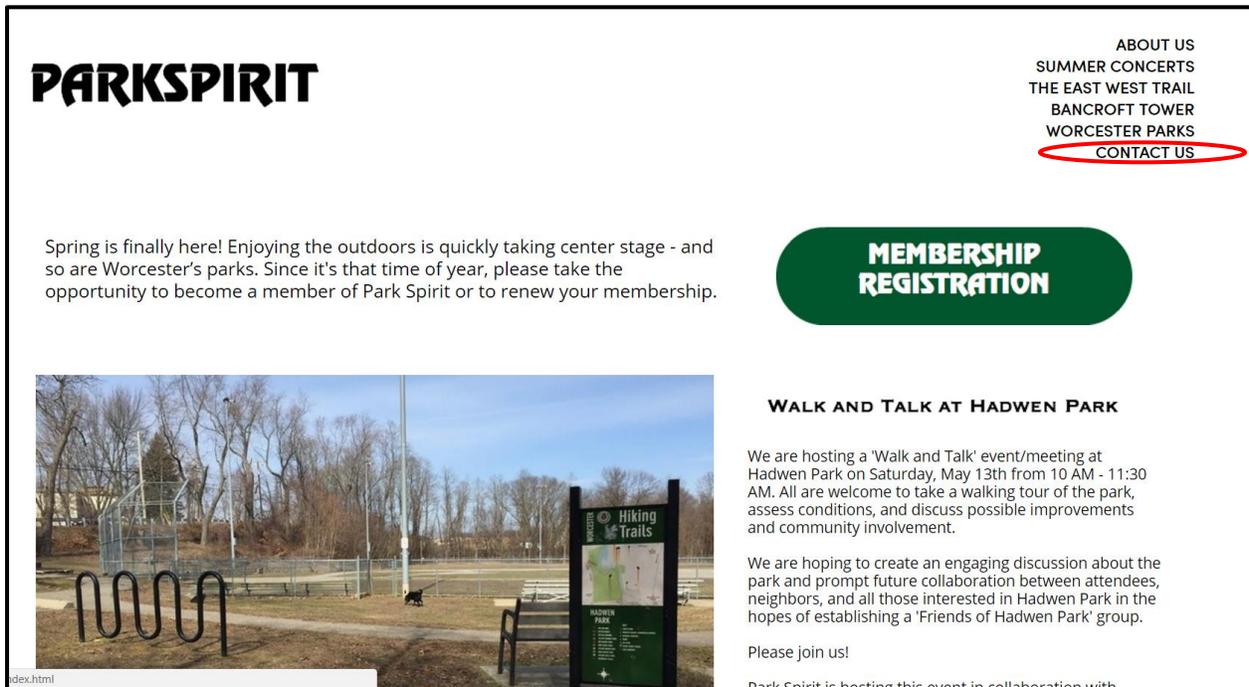


Figure 8: Contact Us section added to Park Spirit's Homepage.

The community service event request form enables either an individual or a group to contact Park Spirit to set up an event where volunteers can perform a multitude of tasks from clearing trails to trash clean up to sign making throughout Worcester’s parks and trails. Each of these forms is linked to a Park Spirit email address so that upon submission it is automatically sent to the organization, see Figure 9.

[Click Here To Provide Feedback On Worcester's Trails & Parks!](#)

Worcester is home to 60 unique green spaces which are maintained by the City's Parks Department and various nonprofit volunteer organizations. Any feedback you can provide on your experience, possible changes, etc is greatly appreciated!



Name:

Email:

Message:



Thank You!

[Click Here To Organize a Community Service Event!](#)

Figure 9: Contact Us forms ready to be filled out

The “Worcester Parks” page was reformatted to feature 61 individual green spaces home menu of all of the parks, and a button photograph that links to each respective green space biography page. The team also created 15 additional biography pages and populated each of the pages with media content such as historical and present day (2017) photographs highlighting their unique features, graphic slideshows, information about the park’s history, and GPS hotlinks to the location of each park, see Figure 10 for one of the park biography pages.

Adding the “Contact Us” and reformatting the “Worcester Parks” pages is important for raising awareness of the trail. A “Contact Us” page is common on most websites because it creates a line of communication between the public and the organization in charge, in this case Park Spirit. Rick Miller requested a “Contact Us” section to help Park Spirit stay informed on the conditions of the trail and any other feedback that may be helpful to maintain the parks and trails (R. Miller, personal communication, February 1st, 2017). The reformatting of the “Worcester Parks” page was important because it is aesthetically pleasing and creates a uniform look with

the web application. Worcester residents can also learn more about what there is to do at every park to determine which parks they would like to attend.

PARKSPIRIT

ELM PARK
ADDRESS: [284 HIGHLAND ST, WORCESTER, MA 01602](#)

Elm Park was purchased for public use in 1854, which makes it one of the oldest parks in the country - but not the oldest! Contrary to what the plaque on the Edward Winslow Lincoln gate on Russell Street, there are a few parks that are a little bit older than Elm.

When the city went to purchase Elm Park, citizens believed that the \$11,257 was too much to pay for a 'swamp on the outskirts of the village.' The ponds were built in 1873 as a natural drainage for the wetlands. In the early days, the park was just a pasture and dump site, but Worcester's first parks commission Edward Winslow Lincoln urged the city to develop the park. Newton Hill was added to Elm Park in 1888.

In 1909, Frederick Law Olmstead, landscape of Central Park and the Biltmore Estate, redesigned the park. More recently, 1.9 million dollars was invested from state and local monies to redo the playground, install light poles, benches, and picnic tables, and refurbish the pond walls. The wooden bridge was also rebuilt, named after Myra Kraft.

ABOUT US
SUMMER CONCERTS
THE EAST WEST TRAIL
BANCROFT TOWER
WORCESTER PARKS
CONTACT US



Notable Features

[Click Here to Access the East West Trail Mobile Experience](#)



Figure 10: Example of a park biography page

4.2 Development of a Mobile Web Application

We found that by adding information about desired amenities, Worcester residents would be more willing to use the city’s parks and trails. Therefore, the development of an electronic mobile trail experience that possessed live GPS tracking, an interactive challenge, a physical component, and information about the East-West Trail is the student researchers’ main deliverable to the Park Spirit organization. Park Spirit requested the development of a mobile application in the focus group (R. Miller, personal communication, March 10, 2017). Furthermore, 85% of respondents of our survey said that an electronic map would make them more willing to use the city’s parks and trails.

Using the Adobe Muse software we created a mobile friendly electronic trail experience that is housed on the Park Spirit website and satisfies the mobile trail experience sought by our sponsor and Worcester residents. The mobile web application is comprised of four main pages: “The East-West Trail”, “Let’s Hike”, “About the Parks”, and “The Hike the Heart Challenge”. The “East-West Trail pages contains the history and development of the 14 mile urban hiking

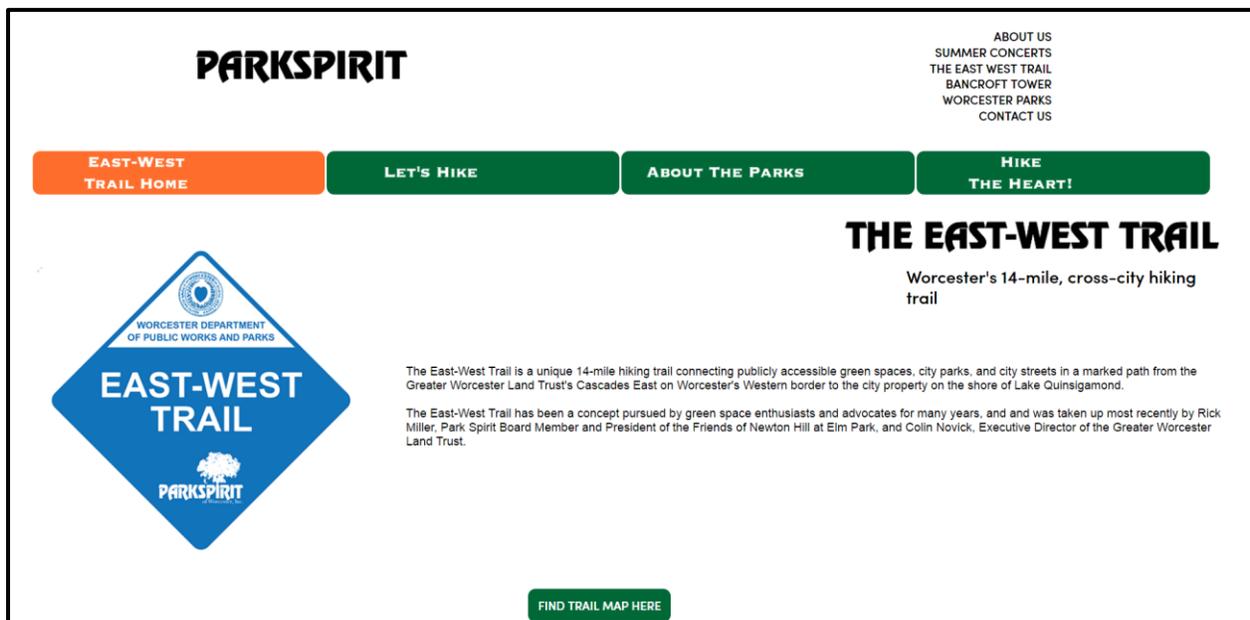


Figure 11: Homepage of the mobile web application

rail itself, graphic images found on each of the 20 green spaces it connects, and a printable version of the map, see Figure 11.

In integrating Google maps into the web application our sponsor is able to provide real time GPS tracking for users so residents can easily hike the trail. The “Let’s Hike” page features ten different iterations of the East-West Trail map reflecting what residents would like in a mobile hiking experience. The following information is an analysis of the different amenities Worcester residents desired based on our research. These include: parking, restrooms, electronic and paper maps, and an interactive challenge.

Parking

Information about available parking along the trail increases resident’s willingness to use the parks and trail as parking in the city is sometimes hard to find. During a guided hike we attended comprised of Rick Miller, two of our group members, and a lifelong learning class from Assumption College; many of the members expressed their concern for adequate parking. At one point a discussion about where to park arose and many of the places that were recommended parking places were actually tow zones. For example, the leader of the guided hike said to park in the WPI parking garage, which being WPI students, we know is a ticketed area with restricted access and a risk of being towed. Another occurrence with inadequate parking happened when visiting Tettassette Ridge. After driving to the entrance, we realized we had two options: the first pull into a neighbor’s driveway, the second park on the side of a very narrow street which would leave our car on a neighbor’s lawn or taking up the majority of the street. One of these neighbors had “No Parking” sign in front of their property as well.

In response to question 5 of our survey, “Would any of the possible changes make you more likely to use the parks or trails?” 57% of respondents answered “Yes, Additional parking availabilities” and another 29% answered “Maybe, additional parking availabilities”. This means

that 86% of the respondents (287 people) would be more likely to use these green spaces if there was more parking available. Figure 12 contains the Parking & Bus Stops map we created.

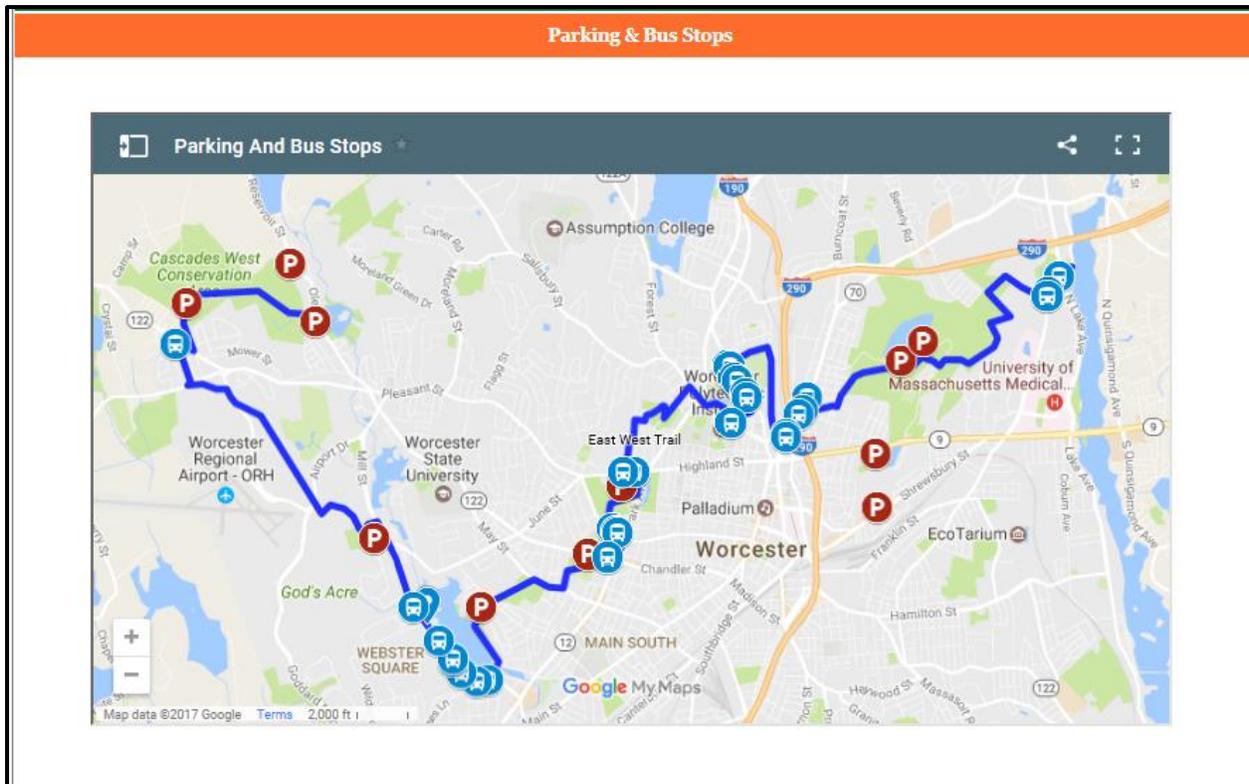


Figure 12: Parking & Bus Stops map from web application.

Restrooms

Another amenity that has a significant role on residents' willingness to go to Worcester green spaces was accessible restrooms. During our participatory research we found that only six of the twenty parks found on the East – West Trail had restrooms (not including port-a-potties that were found at green spaces that were under construction). Our survey showed that 65% of respondents (216 people) would be more likely to use parks if there was accessible restrooms while another 20% (67 people) responded that access to a restroom may make them more likely to use the parks. In sum, around 85% of respondents (283 people) would be more likely to use parks if they had easy access to restrooms. We created another Google Map that shows the restrooms throughout the trail, view in Figure 13.

Interactive Challenge

In meeting with the president of Discover Central Massachusetts, Christina Andreoli, we found that Worcester residents tend to enjoy engaging activities, ranging from fitness components to geocaching or informational scavenger hunts amongst the city's green spaces. In our survey, 69% of respondents said that an interactive challenge would make them more likely to use parks or trails. Furthermore, in question 4 of our survey, "I generally use parks or trails for..." 68% of respondents said fitness and 88% said leisurely activities (picnics, reading a book etc.). Based on this information the "Let's Hike" section contains various layers to accommodate the different interests of Worcester residents. The layers include maps of the following: "Trail Overview", "Just the Parks", "Historical Landmarks", see Figure 14.

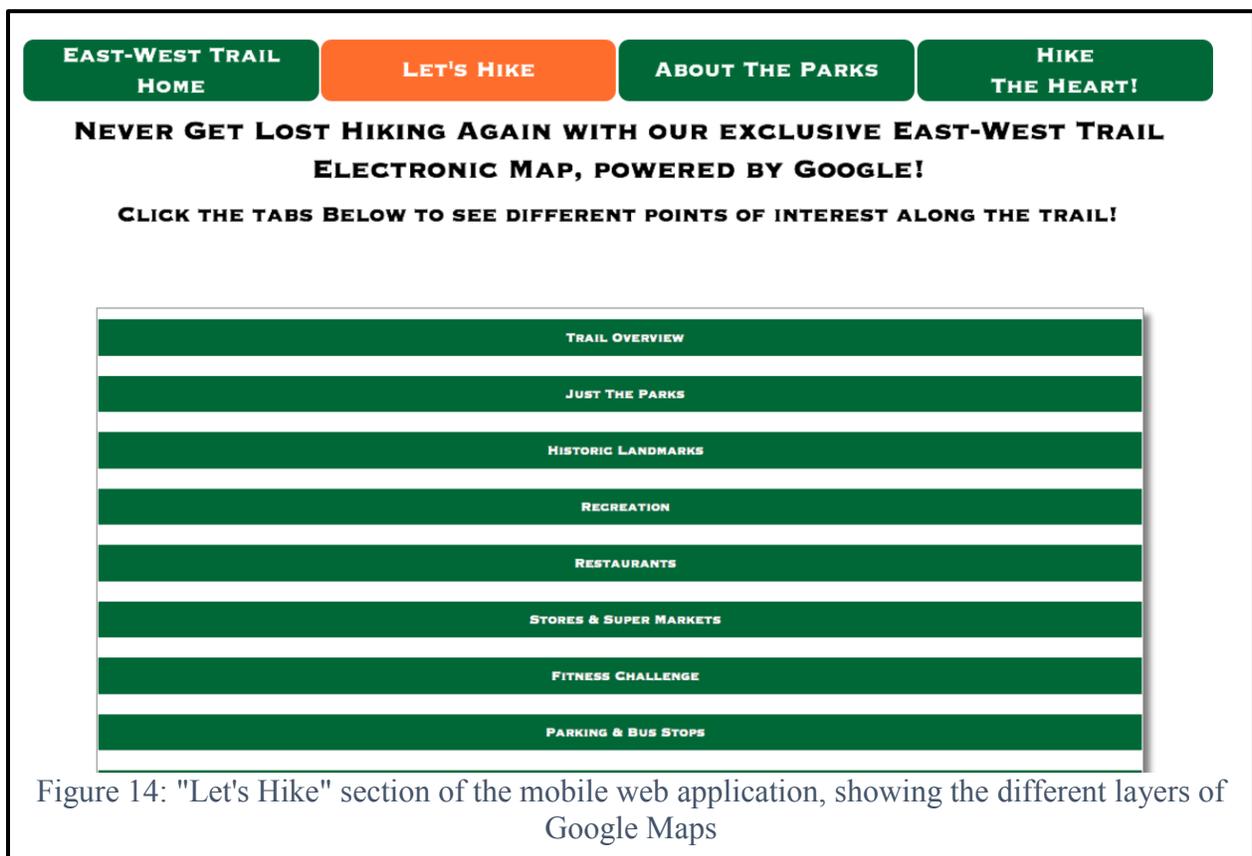


Figure 14: "Let's Hike" section of the mobile web application, showing the different layers of Google Maps

Another benefit to the Google map integration is that a user can click the upper right corner of our map on the web application and the map will expand to full screen in Google

Maps. Here you can save the map to your phone, using your Google account, enabling you to use the map “offline” or without using Wi-Fi or cellular data, see Figure 15.

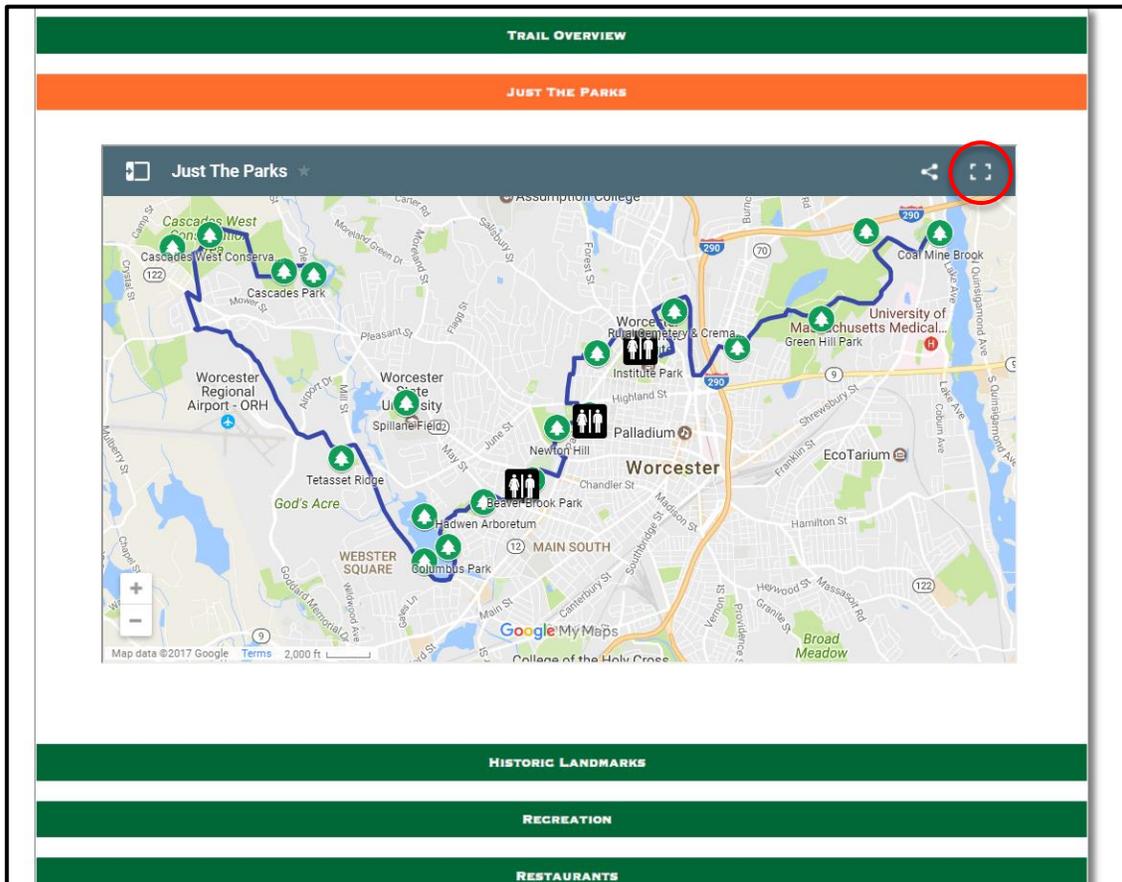


Figure 15: Example of a Google Map layer showing the button that allows you to access the maps offline

Similarly the Google maps integration was used for the “Hike the Heart Challenge” page. The “Hike the Heart Challenge” is an annually occurring event hosted by the Park Spirit of Worcester Inc. where the city’s residents hike the East-West Trail in three segments: “The Western Leg”, “The Central Core”, and “The Eastern Leg” over the course of three Saturdays in the summer time. You can find each of these sections as well as an overview of the whole challenge in Google map form on the “Hike the Heart Challenge” page of the web application, see Figure 16.

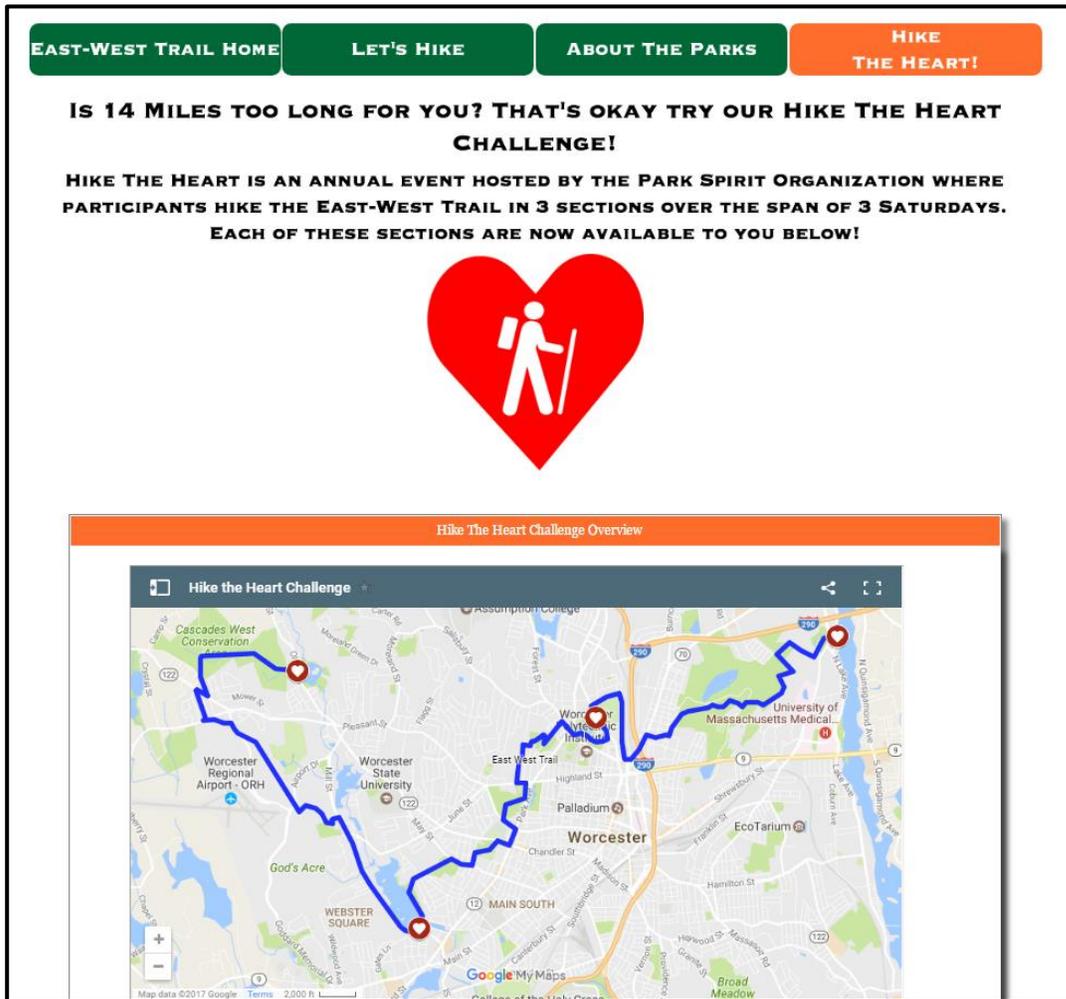


Figure 16: "Hike the Heart" section of the mobile web application

Lastly the “About the Parks” page provides information about each of the 20 green spaces that comprise the East-West Trail. It is constructed identical to the “Worcester Parks” home page of the Park Spirit website, but specific to only the trail’s green spaces. Each of the tiles found on this page is linked to a biography page about the respective park or trail, and contains present day (2017) images of its features, GPS hotlinks, and a brief history of the green space, see Figure 17.

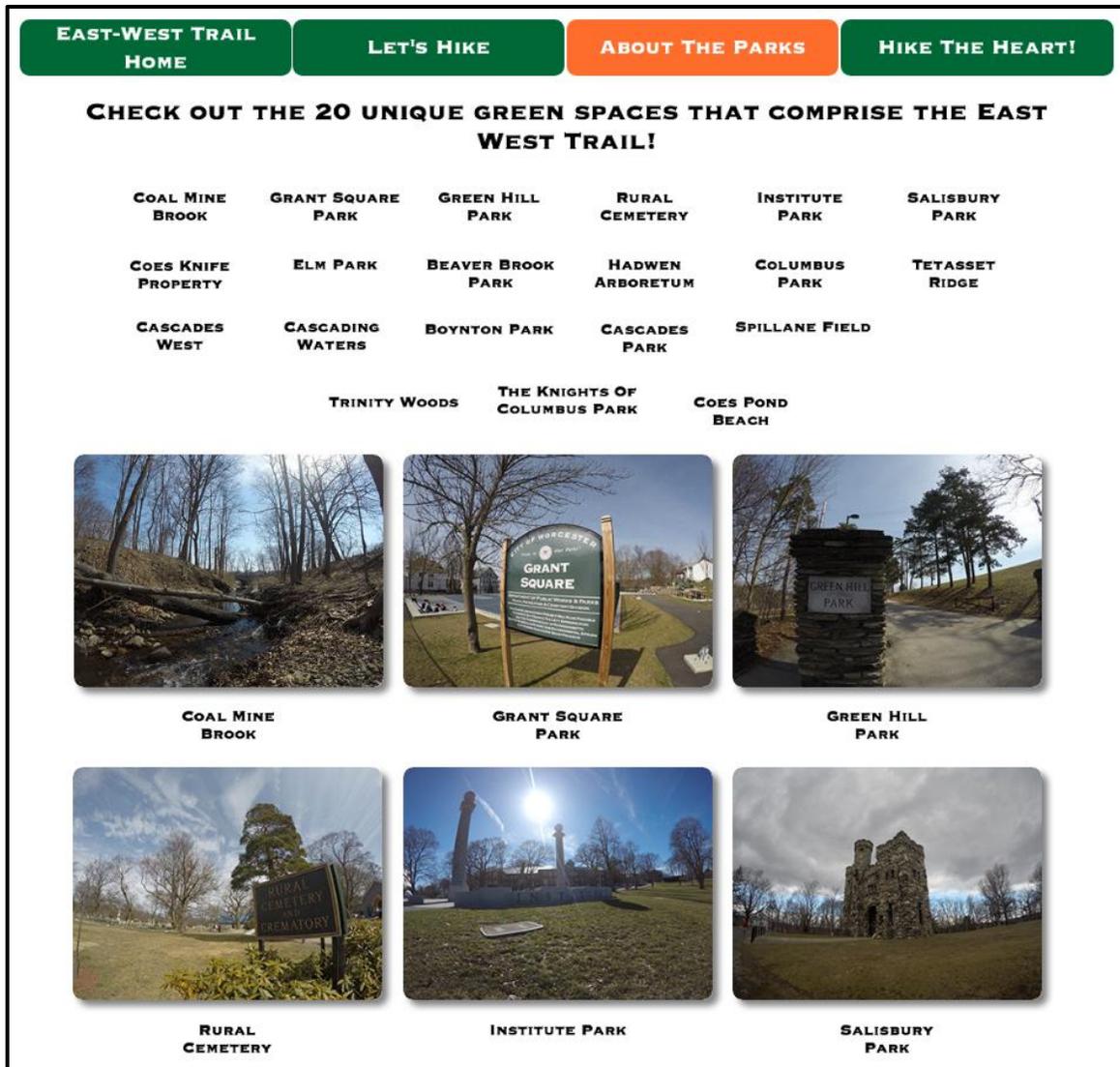


Figure 17: Overview of "About the Parks" section of mobile web application

We shared an electronic file with The Park Spirit Organization that contains all of the Muse files, coding scripts, and content we used to build the mobile web application and expand the website. We also created two "How To" guides to be used by the Park Spirit Organization in maintaining the mobile web application and its technological counterparts. The first guide provides a step-by-step process of creating a Google map, dropping pins, and creating different layers (iterations of the map). It also provides information on how to embed the Google map widget into the web app and the JavaScript code that Jim Monaco of the Worcester Polytechnic

Institute's (WPI) Academic Technology Center (ATC) developed to ensure that the page does not have a loading delay. The second guide provides a process by which the Park Spirit organization can update and add additional content to the mobile web application and the Park Spirit website in general. It contains templates for the various pages the Revealing Worcester's Hidden Gems Team constructed so that consistency can be kept throughout the website and web application.

4.3 The East-West Trail Brochure

In collaboration with the Park Spirit of Worcester Inc., we designed a tri-fold brochure to serve as both an informative and incentivizing option for publicizing the uniqueness of the East-West Trail. The outer three panels provide information about the Park Spirit organization, the East-West Trail and photographs of historic Bancroft Tower and other green spaces. The inner panels house a complete map of the East-West Trail along with photographed highlights of the places you can see along the trail. The brochure is available for download on the expanded Park Spirit website and can easily be printed for users who prefer a paper copy of the trail map in place of the aforementioned electronic option.

Our survey demonstrated that 82% of respondents said they would want to use a paper copy of a map. In our interview with Christina Andreoli, President of Discover Central Massachusetts, we found that the East-West Trail was not amongst the various trails mentioned in the fall and spring edition of their tourism pamphlet. She herself was also not aware of the existence of the trail (C. Andreoli, personal communication, April 10, 2017). To further publicize the East-West Trail we shared a copy of the brochure with Christina Adreoli, to be placed in their fall and spring Worcester Tourism guides and placed on the Discover Central Massachusetts website. To see the brochure please see Appendix 7.

4.4 A Promotional Video for the East-West Trail

To reach a broader audience and address the fact that residents get their information from various sources we developed a promotional video for the East-West Trail to provide another method of publicizing the trail and its new electronic attributes. The video is about three minutes in length and introduces the viewer to a brief background on the city of Worcester and its abundance of green spaces. The film then transitions into the development of the East-West Trail and highlights a variety of the 20 green spaces that it spans as well as live-action footage of residents hiking at different points along the trail. A major proponent of this video was to connect the viewer to familiar locations that they may frequent while performing their daily activities throughout the city of Worcester and inform them that these locations are part of a unique 14 mile long urban hiking experience. Furthermore this video was created to appeal to viewers of all ages and is available to the public.

4.5 An annual Egg Hunt at Elm Park

In interviewing Purvi Shah of Worcester Polytechnic Institute's Marketing Department and Christina Andreoli of Discover Central Massachusetts **we found that while Park Spirit holds a successful annual "Hike the Heart Challenge" the organization can greatly benefit from the development of more trademark events.** Given the timing of the project the student researchers organized a successful egg hunt in collaboration with Big Brother Big Sister on behalf of the Park Spirit of Worcester Inc. The event took place in a section of Elm Park due to its location to the Big Brother Big Sister program and provided over 200 eggs filled with candy and facts about the East-West Trail and Worcester parks and trails in general, see Figure 18 for an example of an Easter egg that was hidden.



Figure 18: One of the Easter eggs that were hidden containing candy and a fact

Kids are also able to receive more candy at the end of the hunt if they can provide one of the facts they had learned about Worcester’s green spaces. Aside from being a major publicity event this also served as a networking opportunity for the Park Spirit of Worcester Inc. as they are now in contact with Big Brother Big Sister and can facilitate the egg hunt annually as well as develop future events.

4.6 Backpack Mail

Another networking and publicity component for Park Spirit was a backpack mail flyer. Backpack mail was sent to nine elementary schools along the East-West Trail. Backpack mail is usually done in elementary schools, where flyers and other handouts are given to students to bring home so their families receive the information. In total 3,500 flyers were given out across the nine schools. For a list of schools and number of flyers given to each school see Appendix 9. The flyer contains similar information to that of the brochure we created and serves as both an informative and incentivizing option for publicizing the uniqueness of the East-West Trail. The

flyer contains a map of the trail as well as information about the trail and a reminder to keep an eye out for an event in September, see Appendix 10.

4.7 Media Content Archive

The focal point of our project was the East-West Trail, specifically the 20 green spaces that comprised it, the Revealing Worcester's Hidden Gems Team acquired both photographic and video content on 41 of Worcester's green spaces on request from our sponsors. Some of these photos and videos are present in the renovated Park Spirit website, the mobile web application, the promotional video, brochure, and back pack mail. We have categorized all of the media content collected by their respective green space and have produced a copy for the Park Spirit of Worcester Inc. to use for advertisement across their social media accounts on Facebook, Twitter, and Instagram and other publication purposes. All of the content was captured using a Go Pro Hero 5 camera with 4k capabilities and with over 500 media files archived the Park Spirit organization has a wide selection to choose from.

What initially began, as the development of a mobile application for the 14 mile urban hiking experience that is the East-West Trail has since become development of a marketing campaign Park Spirit of Worcester Inc. can use to effectively publicize both the East-West Trail and Worcester's green spaces to the city's 180,000 residents.

Chapter 5: Conclusions and Recommendations

The East-West Trail is truly a hidden gem in Worcester. After working in collaboration with the Park Spirit of Worcester Inc. for the past 14 weeks the student researchers' compiled a list of recommendations to assist Park Spirit in accomplishing their goal of enhancing the overall trail experience for Worcester residents of all ages thereby increasing utilization of the East-West Trail:

1. To continue networking with Worcester's various organizations and businesses.
2. To continue holding and creating trademark events along the East-West Trail.
3. Look into the development of a recognizable brand icon for the East-West Trail.
4. To effectively provide ample signage.
5. To consider the development of a handicap version of the trail.
6. To consider a revision of the Western Section of the East-West Trail.
7. To use the media archive for weekly social media posts.

5.1 Networking

When the project initially began in January 2017 the Revealing Worcester's Hidden Gem Team was under the impression that the Park Spirit of Worcester Inc. was this big umbrella organization that had various other organizations beneath it. However we have since then concluded that Park Spirit falls under the umbrella of Worcester's green spaces along with various other nonprofit organizations of a similar purpose. Throughout the course of the project the team has established connections with Worcester's Parks Department and Discover Central Massachusetts. We recommend Park Spirit continue to update Discover Massachusetts with any changes or events on the East-West Trail, as Discover Central Massachusetts is a well-established organization that has a budget for publicizing such events (C. Andreolli, personal

communication, April 10, 2017). Discover Central Massachusetts has already expressed interest in advertising the East-West Trail in their Fall and Summer tourist guides.

We also recommend that Park Spirit network with the city's various businesses to provide incentives to trail users, advertisements of the trail, and or adopt a segment of the trail. The student researchers reached out to multiple businesses to see if they were willing to house the brochure discussed in Chapter 4 and or provide publication of the trail on the back of their menus. Many businesses seemed interested in the gesture but do to time constraint the team was not able to make this initiative come to fruition. Having companies adopt a section of the trail can be beneficial in providing funds for signage that we will discuss later in this chapter.

5.2 Developing Trademark Events

Worcester is home to some 70 unique green spaces and of course the East-West Trail. After the success of the egg hunt and the Earth Day clean-up **we recommend Park Spirit to continue holding the egg hunt annually.** Worcester is home to multiple youth, volunteer, and community organizations that can provide partnership in hosting trademark events. The egg hunt discussed in Chapter 4 connected the Big Brother Big Sister organization to Park Spirit for a successful event **and recommend that Park Spirit continue to strengthen this relationship while also forming new ones for park clean up days, Hike the Heart, and other events.**

We also recommend that Park Spirit generate at least two more trademark events to further publicize the East-West Trail and Worcester's green spaces. An effective trademark event is an event that people automatically associate with Park Spirit; these will help build the foundation for making the East-West Trail a household name.

5.3 Rebranding

Through an interview with a marketing/branding experts and our own personal research we have recommend that Park Spirit create a brand and promote it through their trademark events. In an interview with Professor Shah, who has a PhD in marketing from Texas Tech University and teaches at Worcester Polytechnic Institute, we learned that the current East-West Trail diamond sign cannot be considered a logo. Shah explained the primary reason for this is because there is too much writing on the sign to be constituted a logo. Shah went on to say that this is an issue because developing a strong logo is a major component of marketing and branding (P. Shah, personal communication, March 17, 2017).

Christina Andreoli also stated that the trail marker was an efficient design for a trail marker but not an effective branding logo like the Nike swoosh or McDonald's golden arches. She gave similar feedback to Professor Shah as to what can be improved upon as for a successful marketing campaign (C. Andreoli, personal communication, April 10, 2017).

5.4 Develop a Handicap Accessible Route

Part of the goal of this project was to enhance the trail experience for Worcester residents of all ages. Since the East-West trail is an urban hiking trail that utilizes city streets and sidewalks it is possible for those with mobile restrictions to participate. While some components of the East-West Trail not handicap accessible there are plenty of green spaces towards the middle of the trail with paved streets and sidewalks that those with mobile restrictions. **We recommend that Park Spirit explore the opportunity to make the East-West Trail even more unique by developing an alternate route that enables residents with mobile restrictions such as wheelchairs to experience the city's hidden gems.**

5.5 To Revise a Portion of the Western Section of the East-West Trail

During our hike with members of the Park Spirit, the reporter and photographer from Worcester Telegram & Gazette we noticed that larger portion of the East-West Trail's Western Section is rather dismal. The mile and a quarter section along Mill Street is not only hard on the feet but also is not

aesthetically pleasing as it runs through the Worcester's more corporate section. We recommend that Park Spirit seek an alternate route, potentially through God's Acres, to reinvigorate this section of the East-West Trail.

5.6 To Utilize the Media Archive for Social Media

Currently Park Spirit has social media outlets in Facebook, Instagram, and Twitter all of which can be connected to share and post the same media. **We recommend that Park Spirit look into creating a weekly post across these forums that is unique to their purpose and encourages followers to go out and explore Worcester's various green spaces.** The Park Spirit of Worcester may begin these weekly posts using some of the media content we provided them with, detailing some of the uniqueness of the East-West Trail.

The student researchers firmly believes that the awareness campaign tools described in Chapter 4 and completion of the recommendations discussed in this chapter can help Park Spirit make the East-West Trail a household name throughout Worcester.

Spanning 20 green spaces across 14 miles, the East -West Trail provides users an opportunity unlike any other to hike across urban, rural, historic, and industrial sections of the city of Worcester. Now that user are equipped with a mobile web application we hope you will not ask "What is the East-West Trail", but "Where do I begin". There is just one question remaining, are you up for the challenge?

If so please visit <http://www.parkspirit.org/the-east-west-trail.html>

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Appendix 1.

Focus Group Questions

Preamble: You have been asked to partake in a focus group as a part of the Revealing Worcester's Hidden Gem: Promoting the East-West Trail project. The purpose of this project is to create a tool intended for the Park Spirit organization to assess current awareness and utilization of the East-West trail, Worcester's first urban hiking trail. Your responses are entirely voluntary and you can decline to participate at any point of the research process. By completing this focus group you are giving your consent that you are over the age of 18 years old and any information given can be used in our research. All answers are private and confidential.

Members:

Date:

1. What is your opinion of the East-West Trail in general?
2. What do you think the East-West Trail brings to Worcester?
3. What do you think can be improved upon currently regarding the trail?
4. How does the East-West Trail compare to other urban hiking trails?
5. What is your goal for the East-West Trail?

Appendix 2.

Interview Questions

Preamble: You have been asked to partake in an interview as a part of the Revealing Worcester's Hidden Gem: Promoting the East-West Trail project. The purpose of this project is to create a tool intended for the Park Spirit organization to assess current awareness and utilization of the East-West trail, Worcester's first urban hiking trail. Your responses are entirely voluntary and you can decline to participate at any point of the research process. By completing this interview you are giving your consent that you are over the age of 18 years old and any information given can be used in our research. All answers are private and confidential.

Purvi Shah

1. What challenges do we face when trying to brand a large area such as the East West Trail?
2. Should we try to design a new logo or slogan for the East West Trail?
3. How can we use an on-trail activity to push the East West Trail brand/theme?
4. What are methods we can use to raise awareness and peak interests in our target audience (families)?

Appendix 3.

Preamble: You have been asked to partake in an interview as a part of the Revealing Worcester's Hidden Gem: Promoting the East-West Trail project. The purpose of this project is to create a tool intended for the Park Spirit organization to assess current awareness and utilization of the East-West trail, Worcester's first urban hiking trail. Your responses are entirely voluntary and you can decline to participate at any point of the research process. By completing this interview you are giving your consent that you are over the age of 18 years old and any information given can be used in our research. All answers are private and confidential.

Rob Antonelli: Assistant Commissioner of the Worcester Parks Department.

1. What is the Parks Department's role in the maintenance and development of Worcester's trails?
2. What are some ways the Parks Department publicizes their parks?
3. What are some challenges you face regarding publicity?

Appendix 4.

Preamble: You have been asked to partake in an interview as a part of the Revealing Worcester's Hidden Gem: Promoting the East-West Trail project. The purpose of this project is to create a tool intended for the Park Spirit organization to assess current awareness and utilization of the East-West trail, Worcester's first urban hiking trail. Your responses are entirely voluntary and you can decline to participate at any point of the research process. By completing this interview you are giving your consent that you are over the age of 18 years old and any information given can be used in our research. All answers are private and confidential.

Christina Andreoli: President of Discover Central Mass

1. What are some ways Discover Central Mass publicizes their events Worcester's parks?
2. How much goes into making a professional website for marketing?
3. Do you think the Discover Central Mass' Website would benefit from having information about Worcester's parks and trails?

Appendix 5.

Survey Questions

Preamble: You have been asked to partake in a survey as a part of the Revealing Worcester's Hidden Gem: Promoting the East-West Trail project. The purpose of this project is to create a tool intended for the Park Spirit organization to assess current awareness and utilization of the East-West trail, Worcester's first urban hiking trail. Your responses are entirely voluntary and you can decline to participate at any point of the research process. By completing this survey you are giving your consent that you are over the age of 18 years old and any information given can be used in our research. All answers are private and confidential.

Questions

1. How old are you?
 - a. Under 18
 - b. 18-25
 - c. 26-40
 - d. 40-65
 - e. 65+

2. Are you a student currently enrolled in a college or university?
 - a. Yes
 - b. No

- 2b If yes, which school?
 - c. Worcester Polytechnic Institute
 - d. Becker College
 - e. Assumption College
 - f. Clark University
 - g. Worcester State University
 - h. College of the Holy Cross
 - i. Quinsigamond Community College
 - j. Other

3. Have you ever used any of the parks or trails in Worcester?
 - a. Yes
 - b. No

- 3b How often do you use parks or trails for recreational activity?
 - c. Daily
 - d. Once or twice a week
 - e. Occasionally
 - f. Never

- 3c Do you perceive Worcester's parks or trails...(check the following)
- g. To be well maintained (clean)
 - h. To be aesthetically pleasing
 - i. To be safe
 - j. To be accessible by wheelchair or stroller
 - k. To be crowded (filled with people)
4. I generally use parks or trails for...(check the following)
- a. Fitness
 - b. Leisurely activities (picnics, reading a book, etc.)
 - c. Interacting with new people
 - d. Community Events (BBQs, Fundraisers, Concerts, etc.)
5. Would any of the possible changes make you more likely to use the parks or trails? (check the following)
- a. Accessible restrooms
 - b. Postings about community events
 - c. Paper copies of trail maps at beginning of trails
 - d. Interactive challenge (scavenger hunt for example)
 - e. Electronic map (to be used on a mobile device)
 - f. Increased number of trail markers
 - g. Dog friendly components
 - h. Additional parking availabilities
6. Have you ever heard of the East-West Trail?
- a. Yes, I have heard of it and used it
 - b. Yes, I have heard of it and have not used it
 - c. No, I have never heard of it
- 6b If yes, how did you hear about it?
- d. Word of mouth
 - e. Newspaper or Magazine
 - f. Social Media
 - g. Other

Appendix 6.

Green Space Name	Ample Parking	Garbage / Recycling Cans	Wheelchair / Stroller Accessibility	Efficient Signage	Clean Restrooms
Cascading Waters	2	2	1	4	1
Cascades Park	2	2	1	4	1
Cascades West	2	2	1	4	1
Boynton Park	3	4	1	5	1
Spillane Field	3	4	5	3	4
Tetasset Ridge	1	1	1	3	1
Coe's Pond Beach	3	3	2	3	4
Coe's Knife Property	2	1	1	2	1
Columbus Park	3	3	4	3	1
The Knights of Columbus Park	1	1	1	2	1
Hadwen Arboretum	2	1	1	4	1
Beaver Brook Park	4	5	5	5	5
Elm Park	4	5	5	5	5
Salisbury Park	3	2	2	5	1
Institute Park	3	4	4	5	4
Rural Cemetery	4	1	4	4	1
Grant Square Park	3	3	4	4	1
Green Hill Park	5	3	4	5	5
Trinity Woods	1	1	1	1	1
Coal Mine Brook	2	1	1	2	1
	1 = little - none	2 = below average	3 = mediocre	4 = good	5 = very good

Green Space Name	Playground	Athletic Fields / Courts	Historical Landmarks	Pond / Body of Water	Cemetery	Gardens	Fountain (not for drinking)	Picnic Tables	Benches
Cascading Waters				X					
Cascades Park				X				X	
Cascades West				X				X	
Boynton Park				X				X	X
Spillane Field	X							X	X
Tetasset Ridge									
Coe's Pond Beach				X					X
Coe's Knife Property				X					
Columbus Park	X			X				X	X
The Knights of Columbus Park				X					
Hadwen Arboretum		X				X			
Beaver Brook Park	X			X				X	X
Elm Park	X	X *disc golf course	X	X				X	X
Salisbury Park		X	X						
Institute Park		X		X				X	X
Rural Cemetery			X		X				
Grant Square Park	X	X				X		X	X
Green Hill Park	X	X	X	X			X	X	X
Trinity Woods									
Coal Mine Brook				X					



Waterfall at Cascading Waters

About the East – West.

The East – West Trail is the first of its kind in Worcester. The urban hiking trail has many amazing features such as:

- 14 miles long
- 17 green spaces
- Historic Points of Interest
- Restaurants
- Ponds
- Playgrounds

And captures the many beautiful sights of Worcester.



Who We Are

About Us

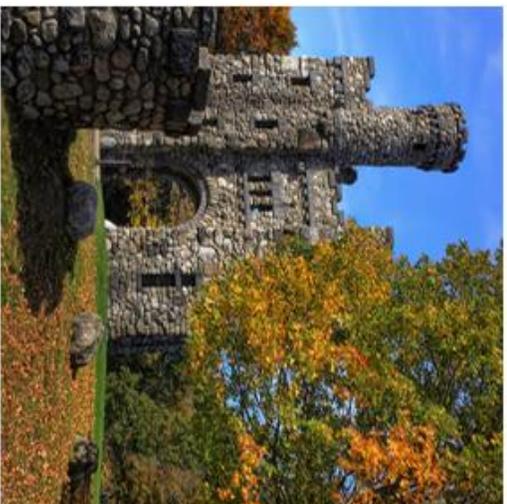
A local not for profit advocacy or organization for local Worcester, MA parks. Our mission is to protect, promote, advocate for, and enhance Worcester city parks.

Contact Us

Email: parkspiritworcester@gmail.com
 Web: parkspirit.org

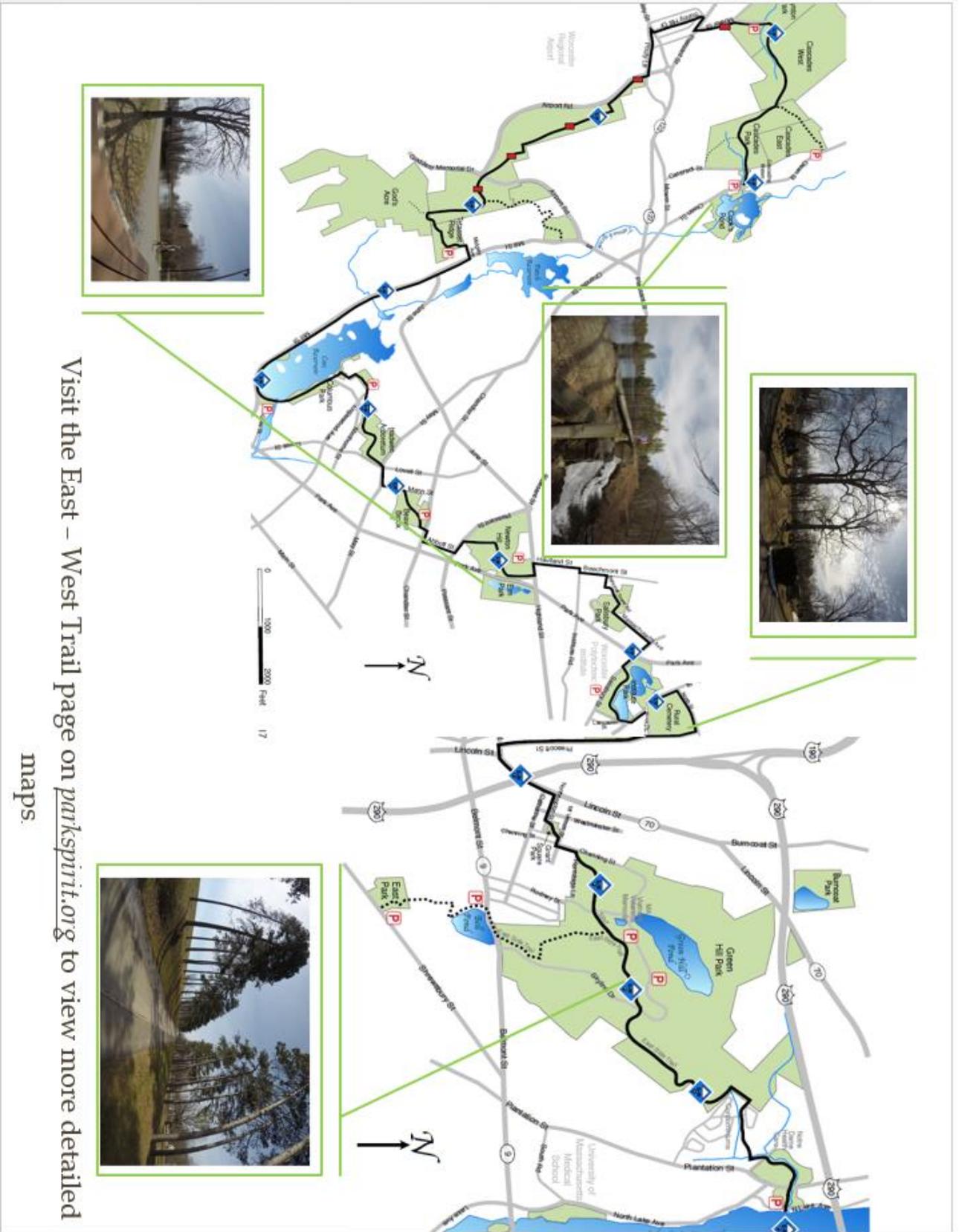


The East – West Trail
 [Worcester, MA 01609]



Bancroft Tower at Salisbury Park





Visit the East – West Trail page on parkspirit.org to view more detailed maps.

Appendix 8.

Did you know Worcester has 60 parks.

Did you know Elm Park was created in 1854 making it one of the oldest parks in Worcester.

Did you know Worcester Parks and Rec has 1,250 acres (about 947 football fields) it's in charge of.

Did you know you used to be able to kayak in Institute pond.

Did you know Green Hill Park has a zoo.

Did you know that there are many concerts held in the parks over the summer.

Did you know Bancroft Tower is open to the public every Sunday in October.

Did you know the East – West Trail is 14 miles long.

Did you know the East – West Trail has 17 green spaces a long it.

Did you know Isaiah Thomas (not the basketball player) is buried in Rural Cemetery

Did you know that the ParkSpirit of Worcester logo looks like this



Did you know the Vietnam Veterans' Memorial is in Green Hill Park.

Did you know Green Hill Park has a golf course.

Did you know you can kayak in Green Hill Park.

Did you know if you walk the outer sidewalk of Elm Park you will be walking $\frac{3}{4}$ of a mile.

Did you know there are mini horses at Green Hill Park.

Did you know there is a peafowl at Green Hill Park.

Did you know there is a disc golf course at Newton Hill Park.

Did you know Brittany Legacy is President of ParkSpirit.

Did you know ParkSpirit holds an event called Hike the Heart on the East – West Trail every year.

Did you know this is the first Easter Egg Hunt done on the East – West Trail.

Did you know if you see this



you are on the East – West Trail

Did you know that Lake Quinsigamond is one of the best rowing courses in the world.

Did you know Boynton Park is Worcester's second largest park with 114 acres.

Did you know Boynton Park has a dog park within it.

Did you know the East – West Trail was official created in 2016.

Did you know ParkSpirit hosts guided hikes along the East – West Trail.

Did you know Beaver Brook Park is one of the most heavily used parks in Worcester.

Did you know there is a waterfall in Cascades Park.

Did you know you can go swimming at Coes Pond.

Did you know \$1.9 million was invested into Elm Park for upgrades.

Did you know Green Hill Park is Worcester's largest park at 482.4 acres.

Did you know you can swim at Quinsigamond Park.

Did you know WPI uses Salisbury Park for some sporting events such as track and field and tennis.

Did you know Institute Park has a wide range of bird species there.

Did you know the entrance to Newton Hill Park is behind Dorhety High School.

Did you know Earth day is April 22nd.

Did you know nature is proven to help mental health.

Did you know you should get atleast 1 hour of exercise a day.

Did you know ParkSpirit is a non profit organization.

Did you know Massachusetts Ave. is a historic district.

Did you know the East – West Trail is first of its kind in Worcester.

Did you know Green Hill Park has 2 ponds.

Did you know the City Common and Elm Park are listed on the National Registry of Historic Places.

Did you know in the winter the Worcester Common Oval has an ice skating rink.

Appendix 9.

*The schools highlighted in yellow were the schools we were recommended by Mr. Berthiaume; the schools circled in red are the ones we sent backpack mail to.

ELEMENTARY SCHOOLS	Principal	Totals
BELMONT STREET COMMUNITY	Dr. Susan Hodgkins	530
BURNCOAT ST. PREPARATORY	Deb Catamero	230
CANTERBURY MAGNET	Mary Sealey	325
CHANDLER ELEMENTARY	Jessica Boss	500
CHANDLER MAGNET	Ivonne Perez	240
CITY VIEW	Yeu Kue	467
CLARK STREET	Dr. Patricia McCullough	220
COLUMBUS PARK	Siobhan Dennis	425
ELM PARK	Joany Santa	472
FLAGG STREET	Mary Labuski	415
GATES LANE	Ann Swenson	658
GODDARD	Dr. Karrie Allen	493
GRAFTON STREET	Tina Schirner	391
HEARD STREET	Thomas Brindisi	292
JACOB HIATT MAGNET	Jyothi Datta	454
LAKE VIEW	Margaret Bondar	320
LINCOLN STREET	Marha Dewar	263
MAY STREET	Luke Robert	340
FRANCIS J. McGRATH	Paula Severin Gibb	300
MIDLAND STREET	Michle Lodowsky	240
NELSON PLACE	Monica Poitras	450
NORRBACK AVENUE	Christina Troiano	500
QUINSIGAMOND	Margatet Doyle	740
RICE SQUARE	Susan Donahue	435
ROOSEVELT	Ellen Kelley	600
TATNUCK MAGNET	Dr. Erin Dobson	380
THORNDYKE ROAD	Kathleen Lee	380
UNION HILL	Ishmael Tabales (acting)	480
VERNON HILL	Carenza Jackson	500
WAWECUS ROAD	Joanna Loftus	140
WEST TATNUCK	Steven Soldi	325
WOODLAND ACADEMY	Patricia Padilla	585
WORCESTER ARTS MAGNET	Mary Ellen Scanlon (acting)	400



PARKSPIRIT

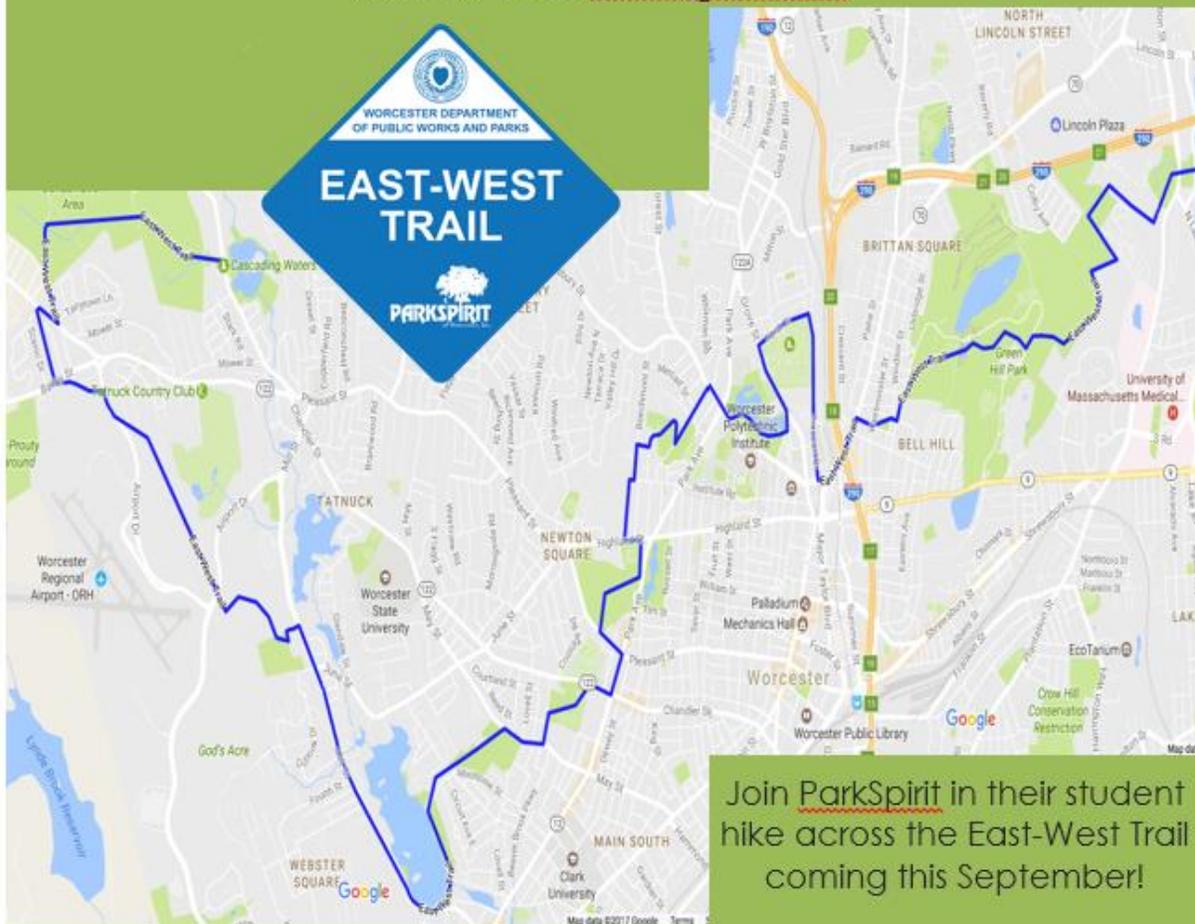
of Worcester, Inc.

A nonprofit advocacy group for Worcester's parks.

PO Box 20088
WORCESTER, MA 01602
PARKSPIRIT.ORG

Discover the East-West Trail!

The East-West Trail is a unique 14-mile hiking trail connecting publicly accessible green spaces, city parks, and city streets in a marked path from the Greater Worcester Land Trust's Cascades East on Worcester's Western border to the city property on the shore of Lake Quinsigamond.



Join ParkSpirit in their student hike across the East-West Trail coming this September!

Check out parksprite.org and email info@parksprite.org with any questions!