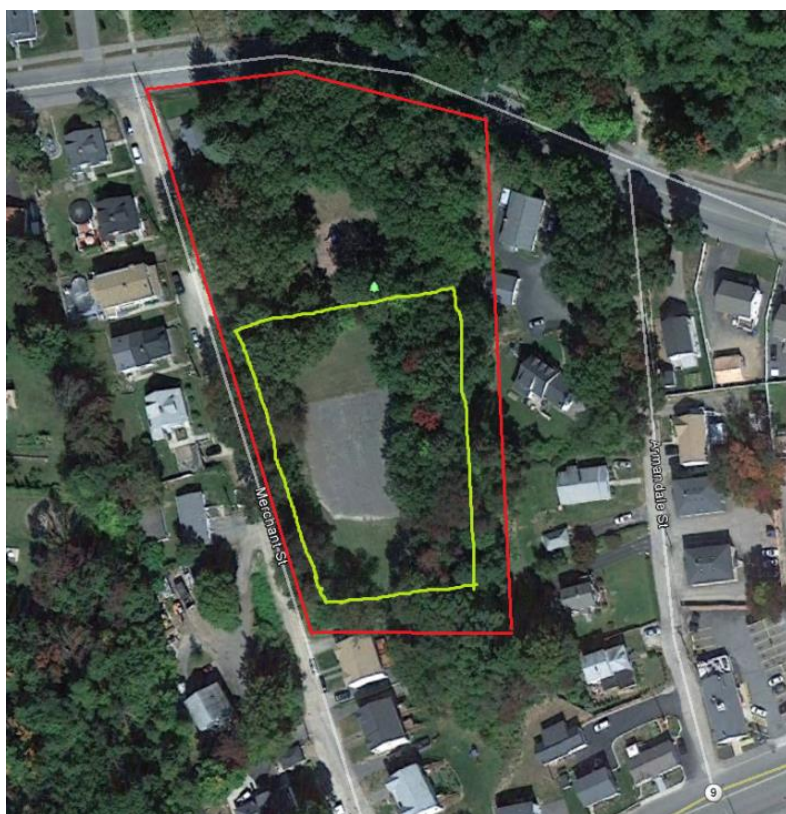


Mapping the Potential For Urban Agriculture in Worcester:

A Land Inventory Assessment



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Abstract

This project intended to identify and present the potential for urban agriculture in the city of Worcester through the creation of a vacant, public land inventory. This was achieved by working with local stakeholders, analyzing successful examples from other cities, and utilizing ArcGIS software. Upon completion it was revealed that Worcester contains 337 vacant or partially vacant parcels. This inventory should be used to identify potential sites for food production and inform policy decisions regarding food, health, and city planning.

Acknowledgements

The Local Food Production Team would like to express its sincere gratitude to everyone who helped us during the IQP process.

Specifically, we would like to thank Prof. Robert Hersh for his immense contribution to this project. Without his constant guidance and support, this project would not have been possible.

We would also like to thank Prof. Suzanne LePage for her continuous consultation throughout the year. Additionally, her help and guidance during the GIS phase of this project was invaluable and allowed us to create an exceptional final product.

We would like to further thank Liz Sheehan Castro of the Worcester Food and Active Living Policy Council (WFALPC) for bringing to light a critical issue in the city of Worcester and for providing contact information, which led to numerous interviews.

We would like to thank our interviewees for taking the time to speak with us about this project. Their immense knowledge and passion greatly contributed to the final outcome of the inventory.

Lastly, we would like to extend our thanks to the cities of Oakland, Portland, and all those who have pioneered similar land inventory initiatives. Their examples were instrumental in the development of this project and its adaptation to the city of Worcester.

AUTHORSHIP

Jay Ringenbach

Jay worked closely with Matt in the writing intensive portions of this project such as the introduction, background, executive summary, and methodology. Throughout the course of the project, Jay contributed heavily to the initial drafts of all the documents. Furthermore, Jay took the lead in conducting the interviews and also completed multiple interview write-ups.

Additionally, at times when Matt was working individually on the writing aspect, Jay served to aid and advise Wenli in the initial use of GIS. Near the end of the project, Jay was responsible for creating the site profile parcel write-ups and editing the final drafts of each chapter in the report.

Matthew Valcourt

Matt also contributed heavily to the writing aspects of the project throughout the year. Matt worked with Jay in writing the initial drafts for the sections mentioned above, as well as formatted and edited all sections of the report. Matt took the lead in creating interview write-ups as well as perfecting and finalizing the case studies for the report. Toward the end of the year, Matt worked with Wenli on the GIS portion of the project in creating the site profiles and finalizing the format for the database. Matt was in charge of compiling the final report and also served as the overall document editor. In addition to this work, Matt was responsible for locating and photographing parcels for the site profiles.

Wenli Wang

Wenli took the lead in the technical aspects of this project. Wenli was responsible for everything GIS, as well as compiling the database. Wenli also took a large role in writing the technical portions of the report such as the findings and the GIS section of the methods chapter. Wenli worked with Matt to ensure that the statistics and figures included in the findings section accurately represented what we wanted to portray. Additionally, Wenli took the lead in creating our GIS maps and as well as the site profiles. Wenli was also responsible for the references section of the report and ensuring all the in-text citations were correct.

EXECUTIVE SUMMARY

Urban agriculture can be viewed as an industry in that it generates a product, (fresh produce), and it needs certain parties (investors, growers, distributors, etc.) to sustain it. To develop the industry many food policy activists “demand as a first step the accurate mapping of existing and potential urban agriculture sites.” (Taylor, 2012, p. 6). Currently, Worcester has no map or database that identifies suitable sites for urban farms, or school and community gardens. This project focused heavily on the mapping of vacant, public land parcels that could potentially be used for the purposes of local food production in the city of Worcester. This was accomplished by adapting a methodology that drew upon aspects from successful examples such as Portland’s “Diggable City” and Oakland’s “Cultivating the Commons” initiatives. The ultimate goal of this project was to raise awareness of the potential for urban agriculture in the city of Worcester and to create a foundation for greater local food production. Our primary objectives to achieve this goal were as follows:

1. Determine relevant criteria for the land inventory through discussion with local urban agriculture stakeholders.
2. Analyze ways in which other cities have completed land inventories and evaluate the role they played in urban agricultural initiatives.
3. Create a database that includes maps and site profiles of potential food growing sites and establish an easily accessible format for the completed inventory.

In the first phase of this project, we set up a local advisory committee composed of our project sponsor, the Worcester Food Policy & Active Living Council, and other organizations involved in local farming. This committee served to detail which qualities of urban land they deemed to be important in regard to urban agriculture. Additionally they provided us with general information about the climate of urban agriculture in Worcester. By gaining different perspectives from key stakeholders, we were able to ensure that their unique points of view were taken into consideration during the creation of the inventory.

During the second phase of this project, we reviewed reports and articles describing urban agriculture initiatives and the use of land inventories in Oakland, CA Portland, OR, Vancouver BC, Toronto ON, Boston MA, Providence RI, Chicago IL, and others. This research established two main themes. The first was that land inventories are often an initial step toward developing successful urban agricultural programs. The second was that land inventories are multifaceted instruments that serve to both promote urban agricultural policy, and help locate vacant land in urban environments.

The third and final phase of this project involved creating a visual database that identified vacant, publicly owned parcels of land in Worcester. The visual aspect consisted of maps generated from ArcGIS and other imagery resources that displayed different layers utilized in completing the project.

Geographic Information Systems (ArcGIS) refers to mapping and spatial analysis software that integrates a wealth of information including parcel data such as size, address, ownership, and zoning to name a few. With the assistance of our project co-advisor, Prof. Suzanne LePage, and emulating the methodologies from the Oakland and Portland land inventories, we were able to create a database of all the vacant, publicly owned land in Worcester. This finalized database can serve to demonstrate to city officials and others that

Ground Cover

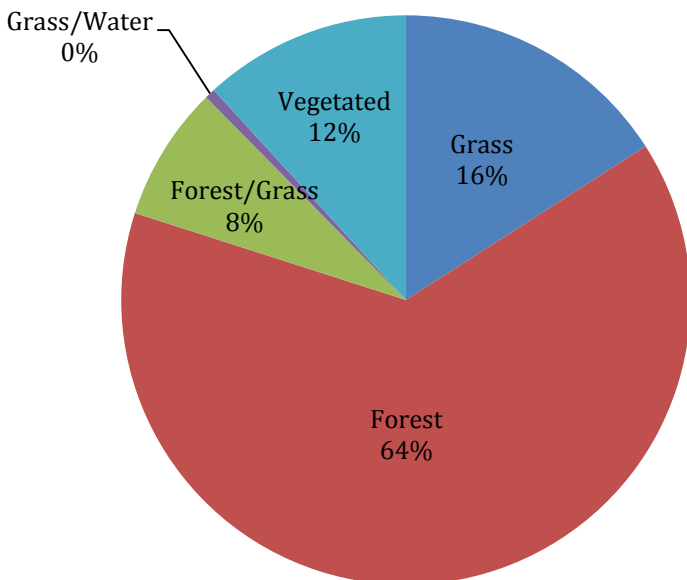


Figure 1: Ground Cover Distribution of Parcels

Area (Acres)

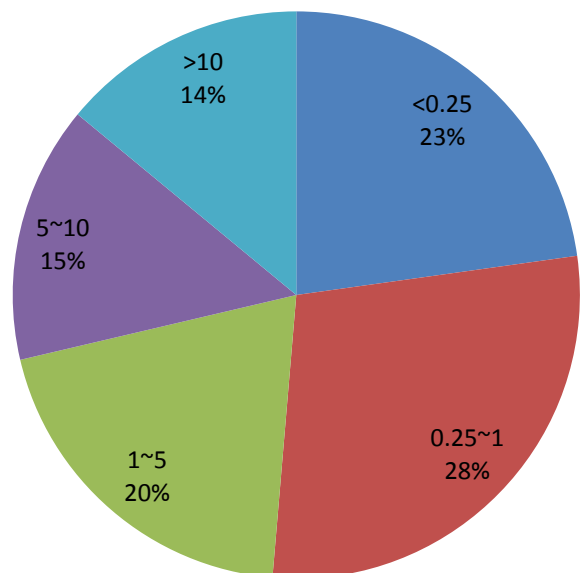


Figure 2: Area by Parcel

urban agriculture can be a beneficial and productive use of land in an urban setting.

During this inventory, we located approximately 2562 acres of vacant land in the city of Worcester. Land was considered vacant if it was void of manmade improvements or appeared to be in a state of disuse. This space is comprised of 337 vacant or partially vacant individual parcels. The parcels we found were owned by a variety of organizations and departments within the city.

Individual site profiles were created for 17 of the 337 parcels. These site profiles are one-page documents that serve as advertisements for the selected parcel. They highlight relevant and important qualities of each parcel pertaining to urban agriculture and contain pictures taken on-site that give a more accurate representation of the current land condition. The finalized excel database includes hyperlinks to these documents, as well as maps formulated from GIS to serve as an all-encompassing publicly owned, vacant land catalogue for the city of Worcester.

This report is only a first step for expanding urban agriculture in the city of Worcester and should be utilized as a tool to identify potential sites for food production, and inform policy decisions regarding food, health, and city planning. However, there are a number of other issues that need to be addressed, both short and long term, so that urban agriculture can become more prominent within the city.

33 Merrick St. (Piedmont Neighborhood)

This is a small plot zoned for general residential use, half of which appears to be partially utilized as a garden. There is an existing fence around the border that requires repair. Sunlight exposure is fair at best due to the fact that the parcel is surrounded on three sides by three story homes. There is a slight slope away from Merrick St. and the agriculture that is occurring is in the ground and not raised beds. This means that soil remediation has already begun. Water access should be simple due to the residential location, but overall the parcel is in a state of disrepair despite the current agricultural activity taking place.



OWNER	CITY OF WORCESTER EOEND
AREA (ACRES)	0.16
ZONE	RG-5
VACANT	YES
GROUND COVER	VEGETATED
POTENTIAL USE	COMMUNITY GARDEN



Figure 1: 33 Merrick St. Site Profile

Short term recommendations:

Ground Truthing:

In order to assess the potential for each site, further ground truthing is essential. Site profiles (see Figure 3) need to be created for the remaining parcels identified in this inventory, so that the most accurate representations of each property are contained in the report.

Public access to the land inventory:

Furthermore, a shared access GIS land locator should be developed as part of a cooperative effort between the local urban agriculture groups and WPI's Center for Sustainable Food Systems. This would make it easier for any interested parties to locate the actual parcels and explore neighborhood characteristics in the city. The inventory should be accessible to the general public so that its implications and value are recognized on a large scale. Additionally, this database needs to be frequently updated and maintained; so that the most accurate depiction of Worcester's vacant land opportunities are represented.

Long term recommendations

Zoning Reform

The city of Worcester should reform the zoning code to allow for greater agriculture in the city. Currently, there are no provisions for agriculture in the Worcester zoning ordinance and some groups, including the Regional Environmental Council and Lutheran Social Services, identified this as a large barrier to further promoting urban agriculture. If the city were to create some type of agricultural overlay zone that allows for crop production, these organizations may not be so hesitant to make use of land.

CDC Responsibility:

Furthermore, Worcester Community Development Corporations need to take a leading role in addressing and promoting urban agriculture. There are many examples of CDC's in other cities that have incorporated urban agriculture into their mission statements. Urban Agriculture fits

nicely with creating affordable housing because it serves to create green space and make neighborhoods more livable. Examples of this can be seen in both Providence and Boston.

Cooperation with Schools:

Finally, proponents of urban agriculture need to continue seeking cooperative partnerships with schools and parks to develop more school and community gardens, as 384 acres of the land belongs to either the school or parks department in Worcester.

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1.0 INTRODUCTION

In the past fifty years, society has observed an increasing trend in the number of people who choose to inhabit cities. “In 2008 for the first time, the world's population was evenly split between urban and rural areas. There were more than 400 cities with over 1 million people and 19 cities with over 10 million people” (Population Reference Bureau, 2013, p. 1). As a result of this shifting demographic trend and an increased awareness in “green living”, cities are beginning to identify and employ urban agriculture as one beneficial and sustainable avenue toward accomplishing this ideal. Generally, urban agriculture can be defined as “the practice of cultivating, processing, and distributing food in or around a city” (Bailkey & Nasr, 1999). Cities not making use of this practice use too many natural resources (i.e. fossil fuels) as a result of their food systems. It is inevitable that a city’s ecological impact stretches far beyond its physical boundaries. (Deelstra & Girardet, 2000). A system based on local food production has the potential to combat the negative effects of today’s industrial food chain and has become an area of increased interest for a number of reasons including: “environmental concerns around reducing the distance food travels, thus reducing food miles and associated greenhouse gas emissions; social concerns with respect to engaging neighborhoods and communities; supporting healthy lifestyles and reconnecting people with the origin of their food”(Oates & Patterson, 2009, p. 4).

Despite the positive impact of urban agriculture, it has yet to take root in many cities due to difficulties encountered by those attempting to implement it. These challenges can take the form of site-related obstacles (i.e. soil contamination, access to water, land tenure), social issues (i.e. political and community support, competing interests for land use) or procedure-related obstacles (i.e. lack of financial resources, volunteers, tools). One of the more pressing challenges is the lack of space, which is required by traditional growing techniques. Most often, the space that is available is allocated for competing interests such as residential, commercial,

or industrial development (Bailkey & Kaufman, 2000). As a result, urban agriculture advocates struggle to locate land within city boundaries that is available for growing.

Cities across the United States such as Portland OR, Oakland CA, and Providence RI have already taken measures to promote urban agriculture. Among the initiatives taken by each of the cities with successful urban agriculture programs, land inventories were a common theme. In Oakland for example, “HOPE Collaborative’s Food System Action Team collectively prioritized the need for such an inventory or assessment as a crucial first step in developing policy and action related to developing a robust food system” (McClitonck & Cooper, 2009, p.5). In order to find space to grow food, each city identified the need to survey what land was available, and determine which parcels could potentially be used for urban agriculture. The completion of an inventory in each city served as a foundation that spurred urban agricultural growth by expanding and improving upon opportunities for local food production.

Prior to this project, the city of Worcester had no existing land survey that was specifically tailored towards the needs of urban agriculture. While local Worcester organizations like the Regional Environmental Council and Worcester Common Ground CDC have had considerable success creating community gardens and supporting a few urban farms, opportunities for more extensive urban agriculture have been limited without a land inventory that identifies suitable parcels of land to grow food throughout Worcester. Such a land inventory would highlight vacant parcels and include characteristics of the land that are important to urban farmers such as size, ground cover, zoning, water access, etc. By emulating what other cities have accomplished with land inventories, we were able to create a unique tool that can be utilized by individuals or organizations seeking to promote urban agriculture and find available land for food production.

The ultimate goal of this project was to create a land inventory for the city of Worcester that specifically highlighted and identified vacant, publicly owned parcels in the city. This was accomplished by conducting extensive background research and interviews with local stakeholders, examining case studies from other cities across the country, and utilizing ArcGIS to carry out parcel analysis for the city of Worcester. Furthermore, we wanted to convey the findings of this inventory in a manner such that all of the information would be easily available

for any stakeholders interested in urban agricultural endeavors in the city. It was our hope that in completing this project, we would be able to emphasize the potential for urban agriculture in Worcester and create a foundation for increased local food production.

2.0 BACKGROUND

We first discuss the various strands of food production that comprise urban agriculture and then examine arguments for its importance in connection to creating a more sustainable food chain, as well as its economic, educational, and ecological benefits. We then consider challenges to expanding urban agriculture in general, and identify common strategies and contextual factors of successful urban agriculture programs in other cities such as Toronto, Oakland, Portland, Vancouver, and Chicago. Lastly we examine the current state of urban agriculture in Worcester.

2.1 A Definition of Urban Agriculture

By definition, urban agriculture is a “unique form of agriculture that produces, processes, and markets food, plant and animal sourced pharmaceuticals, and fibers dispersed throughout the urban and peri-urban areas, usually applying intensive production methods” (Pearson, Pearson, & Pearson, 2010, p.7). More generally, urban agriculture means “growing in ways uniquely adapted to small urban spaces and creating markets for local products” (“Urban Agriculture in Providence, 2013, p.2). This usually entails two similar efforts. The first is made up of school and community gardens. These are typically small, not for profit, and run by groups of local citizens. Often times community gardens are utilized for educational purposes and are valued for the positive social impact they yield on neighborhoods in addition to their productivity value.

The second effort speaks to larger scale urban farming. Although these farms are normally smaller than farms located in rural areas, urban farms can span more than a city block and the techniques used to grow food on these plots are typically much more intensive than traditional strategy (Thornton, Abdul-Kareem, & Dunning, 2009). “Overall, yields are smaller but yields per unit area can be higher than traditional rural farming.” (Golder, 2009, p. 3). The next section of this background chapter will identify the many benefits that agriculture in an urban setting can provide.

2.2 The Importance of Urban Agriculture

In recent years, there has been a rapidly growing interest for greater local food production within cities, especially in the United States. This is mainly due to fact that urban agriculture is a multi-faceted program that generates a variety of benefits for those involved. Some of these benefits include greater community involvement, educational opportunities, decreased fossil fuel consumption, urban greening, increased economic development, and easier access to healthy foods (R. F. P. Council & Washington, 2011).

Community involvement is inherent in the operation of a community garden. Residents that may not otherwise interact with their neighbors are provided with an opportunity for more outdoor recreation in a social environment (Bradley & Mendes, 2005). Ensuring that neighborhood residents are engaged within their respective communities has maintained itself as an important item on the agenda for policy officials at all levels. Urban agriculture is one way to accomplish this goal and can be promoted as a healthy approach to working towards greater community involvement and strengthening neighborhood connections (Oates & Patterson, 2009).

Furthermore, “urban agriculture provides numerous educational benefits, including a better understanding of food sources, food security, health and nutrition, and the environment” (R. F. P. Council & Washington, 2011, p.3). An understanding of food sources and where food actually comes from plays a vital role in increasing awareness for both the local and global food system. In addition to teaching people of all ages how to eat healthy, school gardens and farms can serve as learning tools in a hands on environment “for those interested in biology of food and habitats” (Bradley & Mendes, 2005, p.16). There are many food policy organizations around the country whose overall missions include educating the public about the benefits of healthy food and the opportunities it can provide for a community. These same organizations can also serve as liaisons that help connect residents to locally produced food, and in some cases assist them in establishing small gardens of their own.

Something that has been at the forefront of today’s social consciousness in America and around the world is the reduction of dependence on fossil fuels and other non-renewable energy sources. It is easy to drive an efficient car and even cut down on miles, however a large

source of emissions that we do not regularly consider results directly from the way people eat. This is due to the fact that foods which are not produced locally must be shipped, hauled, or flown to your supermarket before you bring them home to put on the dinner table, inevitably creating 'food miles'. As put forth by the Urban Agriculture Task Force of Providence in 2006, urban agriculture "decreases energy and environmental cost because food travels fewer miles to reach our markets and tables" ("Urban Agriculture in Providence, 2013, p.4). Urban agriculture not only helps to reduce food miles, but also addresses other environmental concerns such as storm water management and greening of the urban landscape (R. F. P. Council & Washington, 2011).

Greening the urban landscape has a wealth of benefits that may not be apparent upon first inspection. "Urban gardens are a lush and colorful alternative to vacant lots covered with broken asphalt, overgrown with weeds, littered with trash, or surrounded by chain link fencing" (McClitonck & Cooper, 2009, p. 5). Urban gardens and farms provide an opportunity to create productive open space where members of the community can enjoy the biodiversity of the area. Finally, a greener landscape in an urban environment contributes to the aesthetics of a city as well as the overall quality of life for its residents (Golder, 2009).

Economic development is yet another advantage of urban agriculture and local food production for a city. Local food production "encourages economic growth by supporting local businesses, creating 'green' jobs, and ensuring that local dollars remain local" ("Urban Agriculture in Providence, 2013, p. 7). If a city wishes to establish a green economy, a sustainable local food system will be the first step in this process. Urban agriculture can provide jobs to people of all ages who are growing, harvesting, or preparing locally grown food. "Vegetables farmed in the city are finding their way onto menus at local restaurants, food carts, and produce stands. As a result, linkages in the local food chain are becoming stronger in concert with a growing consumer demand for local and sustainably grown food" (Golder, 2009, p.6). Although it is not expected that urban farms can generate enough food to support an entire city, they can most certainly help by providing access to affordable healthy food, especially in an age where common food prices continue to rise on an almost daily basis. As these bonds grow stronger, a city's local economy will inevitably improve as well. In addition to

these numerous benefits, green space has also been proven to increase the property value of nearby homes (Golder, 2009).

We live in an age where built environments provide easier access to junk food than quality, healthy foods (Thornton et al., 2009). The concept that this is alluding to is what is known as a food desert, which the USDA defines as a census tract where a substantial share of its residents are located greater than one mile away from a supermarket and where the poverty rate is above 20%. Increasing food production and direct marketing is one way of combating the effects of a food desert. Chief among these effects are the negative health impacts that result from eating fast or junk food on a regular basis. As an alternative, “Community gardens provide an opportunity for healthy, outdoor recreation in a social setting” (Bradley & Mendes, 2005, p. 3) By promoting urban agriculture a community can “help to support access to healthy foods and educate the public about nutrition and health” (R. F. P. Council & Washington, 2011, p.8).

As implied from the advantages explained above, urban agriculture is an appealing initiative in many cities. In the past decade alone, municipal authorities across the country have created provisions in their respective city policies (i.e. zoning, tax incentives, expedited land conveyance, etc.) to allow for greater local food production and more urban agricultural programs. Despite this rapidly growing interest, some local governments struggle with how urban agricultural policy fits into their land use strategies, as well as their scope of operations, especially when considering land being repurposed to grow food (Golder, 2009).

2.3 Challenges for Urban Agriculture

The challenges that are faced by urban agriculture are abundant and have special demands that require more consideration from different aspects than other food production methods. Obstacles this type of endeavor faces can be generally broken up into three distinct categories: site-related, government-related, and procedure-related, (Bailkey & Nasr, 1999).

When considering problems inherent to urban agricultural sites, soil contamination is an essential issue that needs to be addressed before any food can begin to be grown. Many cities around the country contain vacant or unused pieces of land that may or may not have soil

contamination. These are sites where the soil is thought to be contaminated by past industrial or commercial uses, or by atmospheric deposition, and thus unsuitable for growing food (Goldfield, 2009). “Soil contamination can present too complicated and expensive an obstacle to allow cultivation on a particular site; this in spite of government efforts to facilitate brownfield reuse, as well as the growing body of research developing techniques for effective site remediation” (Bailkey & Kaufman, 2000, p.6). Inevitably, many people question whether or not food produced on urban land is safe to eat. Often, urban farmers explore alternative growing techniques such as farming in raised beds.

Water is yet another basic necessity for agriculture. If a site does not have access to water, farming can be nearly impossible. In cities, either domestic or international, water access is a huge problem for farming in urban and peri-urban areas. “The lack of adequate access to water and sanitation clearly can limit or even preclude urban agriculture.” (Nasr, MacRae, & Kuhns, 2010, p.13)

Land tenure is another issue that urban farmers encounter when attempting to secure land for growing in the city. Due to a lack of capital, most urban parcels are not owned outright by those who farm them. “Land used for urban food production is frequently in the hands of private landowners or public agencies that view such land usage as temporary” (Bailkey & Kaufman, 2000, p.61). Growing produce is not an overnight process. Without a guarantee the land will be available for use longer than one growing season, farmers are often reluctant to put too much time and effort into a property that they may be asked to vacate at any time. A solid multi-year lease is generally preferred for this reason, but often times farmers are forced to operate on ‘handshake’ agreements (Barker Interview, 2012).

Another set of issues that inner city growers must face on a daily basis is theft and vandalism. Urban agricultural sites are often located in areas with heavy amounts of foot traffic, thus increasing the likelihood of some type of vandalism occurring. Stolen produce, sign or property damage, and the dumping of garbage are all irritants in an urban setting that can preclude farming in some cases (Bailkey & Kaufman, 2000). Most urban gardens are forced to consider fencing and even video surveillance to protect their investments.

An obstacle such as municipal policy may in fact be the most substantial challenge that impedes urban agriculture. Additionally, public support can sometimes be overlooked as not all residents may be on board with the program. “This could be the result of a narrow understanding of urban agriculture and its benefits, the perception of a limited constituency for city farming, or simply a focus on other civic priorities” (Bailkey & Kaufman, 2000, p.62). Furthermore, competing interests vying for vacant land in a city generally cause major problems for urban agricultural stakeholders. In many cases, city government officials see urban agriculture, at best, as an interim use, not the best and highest use of the land. “How to locate and designate space for urban agriculture as it grows in popularity therefore poses a significant challenge” (McClintock, Wooten, & Brown, 2012, p.5).

Zoning code is another element that can serve as an impediment for those looking to grow food within the city limits. Essentially, zoning laws dictate how land can and cannot be used. Zoning is a driving force behind city planning and is one of the more prominent controls that city government has over how it will develop its ‘built-environment’ (Thornton et al., 2009). In many cities, there is no policy that categorizes food production as a permitted use. This gives the edge to other competing interests to develop vacant land and in some cases precludes farming entirely.

Finally, obstacles related to everyday procedure and operations continuously pose problems for urban agriculture stakeholders. Potential urban farmers are forced to contend with the typical cramped quarters of city life and unlike their rural counterparts, urban farmers and organizations are forced to utilize multiple smaller parcels that tend to be scattered throughout cities (Bailkey & Kaufman, 2000). Having a number of sites fragmented in this manner and run by a single organization creates an entirely new set of problems such as transporting equipment from site to site, arranging provisions for each separate site, and obtaining the necessary personnel to work each site. (Bailkey & Kaufman, 2000). This could potentially be a logistical nightmare that can result in wasted time and effort.

When examining any urban agricultural activity, a lack of financial resources almost always reflects the activities ability to be successful in an urban setting. In addition to high startup costs, farming for an extended period of time in the city requires a considerable amount

of money, for which there is very little public funding available. As a result, many agricultural organizations are forced to rely on limited budgets. Most often, these programs do not have a steady stream of funding and the revenue gained from the product they grow and sell is not nearly enough to support all of the operations that must be continued on a daily basis. Therefore, farmers and organizations are forced to rely on volunteer help, donations, and grants from outside resources as a means to sustain their respective programs (Bailkey & Kaufman, 2000). Ultimately, in order for any agricultural stakeholder to be successful in an urban setting, securing adequate funding is a necessary first step.

It is clear there are many obstacles that stand in the way of urban farming, and all of these obstacles mentioned above make acquiring land for agricultural purposes an exceptionally difficult task. Much of the land that is vacant is not zoned appropriately to allow for agriculture, while other parcels of vacant land may be contaminated or deemed more useful for other city projects by policy officials. Finally, some parcels are often too expensive for urban agricultural stakeholders to farm on. All of these considerations serve to highlight the necessity of mapping suitable and affordable parcels for farming within an urban setting. Many cities such as Toronto, Oakland, Seattle, and Boston (among others) have worked hard to develop successful urban agricultural programs with this same outlook at the forefront of their efforts.

2.4 Overcoming Obstacles to Urban Food Production

Urban agriculture is a relatively new concept in today's society. However, many cities around the United States and the world have already set precedence for implementing successful urban agricultural programs. Cities such as Toronto, Oakland, Portland, Vancouver, Providence, Boston, and Chicago have all utilized different methods and techniques to create programs adapted to their respective environments. They have all addressed and overcome many of the barriers mentioned in the challenges for urban agriculture above. These are examples to learn from and emulate, especially for cities where urban agriculture is not supported. Some ways in which cities have worked to successfully improve urban agriculture include identifying and classifying potential land by means of a land inventory, developing policy recommendations to improve agricultural zoning laws, and setting goals for increasing local food production (Nasr et al., 2010).

Land is an extremely important topic when discussing urban agriculture. In most cities, land is not readily available for urban farming. Potential agricultural sites suitable for growing can be extremely hard to locate due to the complexity of the parcel layout in the city, and the obscurity of ownership for a given parcel. Therefore, one must first identify available land opportunities in an urban setting before they can begin to farm. The idea that parcels of land could be valuable resources when used for agriculture is certainly a newer concept. The city of Portland recognized this and in 2004, took it upon itself to begin a land inventory survey. This survey was to be conducted in order to find and identify vacant land that could potentially be made available for the use of urban agriculture ("Diggable City | Land Use and Food Policy | The City of Portland, Oregon," 2013). Soon after Portland's example, other cities such as Oakland, CA began to initiate the same task. Oakland's HOPE collaborative food system action team "prioritized the need for such an inventory or assessment as a crucial first step in developing policy and action related to developing a robust food system" (McClitonck & Cooper, 2009, p.14). Overall, the team in Oakland identified over 1,200 acres of open space that could potentially be used for urban agricultural activities, and that wasn't including land with dense vegetation. Many other cities have followed suit and conducted their own vacant land inventories, and in doing so have created an extremely beneficial tool, not only for farmers and urban agricultural organizations, but for agricultural policy purposes as well.

Cities such as Toronto and Baltimore have demonstrated ways in which to create or improve zoning policy geared towards urban agriculture. In the early parts of the 21st century, Toronto, like many other cities, had no policy that allowed for agriculture in the city. While other cities struggled with ways to solve this problem, Toronto found a novel way around it. By developing recommendations for zoning policy that spoke to agriculture in terms of "residential/agricultural" or "commercial/agricultural" zones they were able to open up the city to agricultural possibilities. (Nasr et al., 2010) This new approach meant that essentially any space in Toronto could be opened up to farming, and could be approved on a case-by-case basis. Such an individual approach helped create an environment of controlled growth.

Similarly, in 2009 Baltimore's Food Policy Task Force released a list of strategies to increase food access in the city. Four aspects of this strategy pertain directly to zoning impediments:

- I. Encouraging urban agriculture;**
- II. Expanding farmers' markets**
- III. Improving the food environment around schools and recreation centers**
- IV. Establishing “healthy food zoning requirements”**

Number four specifically states “Establishing healthy food zoning requirements” around schools would be beneficial (Thornton et al., 2009). Healthy food zoning can be defined as a reduction in the density of fast food restaurants, restricting fast food restaurants from operating within a specified distance from schools, and providing incentive for farming and large grocery stores in urban areas (“CDC - Zoning to Encourage Healthy Eating - Winnable Battles - Public Health Law,” 2013). Both cities took a novel approach to the zoning issue and came out with entirely different results that eventually resulted in successful urban agricultural programs. Cities that have no provisions for any kind of urban agriculture will need to examine the examples set by Toronto, Baltimore, and others and apply the lessons learned in their own community, in order to create a successful agricultural program. A key takeaway from the actions taken by these two cities is that there is a need for a coordinated effort in developing a policy or regulatory framework that facilitates urban agricultural activity and healthy lifestyles.

Increasing local food production has become an integral aspect of different city agendas around the United States and other parts of the world. Oakland is an excellent example of a once thriving industrial city that has experienced depression and is now attempting to rebound by means of local food production. In 2006, the Oakland city council was brave enough to set a goal of sourcing 30% of its food locally, in order to “reduce its urban ‘ecological footprint’ and create new linkages between local farmers and urban consumers” (McClintock & Cooper, 2009, p.10). Regardless of whether or not this goal was met, this is a clear representation of Oakland’s commitment to expand local and sustainable food production. Providence, RI is another city that demanded change in its local food production system. The Providence Urban Agricultural Task Force was created to increase opportunities for agriculture within the city boundaries. They envision “doubling the amount of food being grown in and around Providence in the next ten years. This will be achieved by increasing the number of home gardeners....community gardens...and urban agricultural businesses” (“Urban Agriculture in

Providence, 2013, p.1). The cities described above are just a few of many model cities for urban agriculture. The goals they set were a first step toward increasing local food production.

These are just a few examples of many of what some cities have done to create an urban agricultural framework. Case studies of more successful cities' urban agricultural programs are presented in Appendix C.

2.5 Worcester's Current Urban Agricultural Landscape

At this point, it is pertinent to consider what actions, if any, the city of Worcester has taken with the intent of promoting urban agriculture or healthy food access. It could be argued that a key aspect of promoting local food production is aiding entrepreneurs in finding available properties. Furthermore, zoning ordinances stipulating agriculture as a permissible use should be addressed. A report organized by the WFALPC titled "Strength and Opportunities to Improve Access to Healthy Food and Active Living in Worcester, Massachusetts" was an initial attempt to describe (among other objectives) the local public policy landscape in Worcester relevant to healthy food access. The report examined in depth Worcester's master plan, open space and recreation plan, climate action plan, and zoning ordinance with regard to healthy food access. One conclusion that was reached in this paper was that "there are few local public policies regarding food availability in Worcester" (WFPALC, 2013). Currently, Worcester has no stand-alone food plan to address certain factors including food production, accessibility/availability of food, and urban agriculture. Despite this, Worcester's 2006 Open Space and Recreation plan "contained references to community gardens and urban agriculture for their value as open space" (WFPALC, 2013). Some objectives of that plan included encouraging community gardens within more densely populated areas, promoting community gardens and identifying parcels, and using vacant lots for an urban gardening program. In addition, Worcester's climate action plan encouraged the implementation of community gardens as a way to combat climate change. However, Worcester's existing area plans do not speak to food access or any of the ideals mentioned above (WFPALC, 2013).

Regarding Worcester's zoning code for healthy, locally grown food, the only language in the zoning ordinance concerning food production is "agriculture, horticulture, viticulture, and

flora culture, on parcels less than five acres” which is permitted by right in all zones excluding Residential. Currently the zoning ordinance does not address farmers markets, mobile food vendors, or urban agriculture (WFPALC, 2011, pg.13).

Upon inspection, it is very clear that Worcester has taken few steps toward promoting urban agriculture as a crucial piece of their regulatory framework. However, there are private organizations in the city that are currently working to address this gap in Worcester public policy. Listed below are the current organizations and programs in place that address urban agriculture, along with a map of operating school and community gardens in Worcester, and two short case studies of the current farms in the city.

Table 1: Current Worcester Urban Agriculture Initiatives

<p>Worcester Food Policy and Active Living Council</p>	<p>Engages diverse partners in Worcester to foster a healthy and just food system and active community environment.</p>
<p>Regional Environmental Council</p>	<p>Environmental justice organization located in Worcester dedicated to building healthy, sustainable, and just communities in the area.</p>
<p>Lutheran Social Services</p>	<p>Works closely with Worcester Common Ground to provide a plot for recent immigrants to farm. Additionally they support the farmers markets in the city by helping to run and supply them and also run an incubator farm in Sutton, MA.</p>
<p>Worcester Common Ground</p>	<p>Works toward providing space not only for affordable housing but toward providing space for growing as well. Their close connection to Worcester city government is central in their ability to fill this roll.</p>
<p>Nuestro Huerto Farm</p>	<p>A volunteer run community farm providing organic produce to Worcester’s Main South community.</p>

Community Gardens (UGROW)	A network of 62 urban gardens in Worcester that the REC facilitates.
YouthGROW	Provides educational opportunities to school aged children within the city of Worcester and exposes them to agriculture.
Greenhill Park Farm	Small farm and petting zoo venture run by the Worcester Department of Public Works.
School Gardens	14 Worcester public schools partner with the REC and provide students with a safe environment to plant, grow, and learn about healthy food.
Hunger Free & Healthy	An initiative undertaken by the WFPALC to ensure food security within low income neighborhoods in Worcester.
Worcester Farmer's Markets	Run by the REC, provides local vendors with an opportunity to sell their food to Worcester residents at 105 Murray Avenue during the farming season.
Mobile Farmer's Market	Created by the REC, a mobile way to disperse locally produced food to Worcester residents on Tuesday's and Thursday's.
EAT Center	Cooperative effort amongst Worcester Common Ground, Lutheran Social Services, and Regional Environmental Council to utilize undeveloped tax levy parcels in Worcester that are suitable for agriculture.
Drop It Like It's Hot Sauce	An initiative coordinated by the REC where YouthGROW members and staff produce and sell hot sauce using ingredients grown from the school gardens.

Current Urban Agriculture Activity in Worcester

The map below shows the school gardens, community gardens, and urban farms that currently operate in the City of Worcester. This map was derived from a list kept by the Regional Environmental Council.

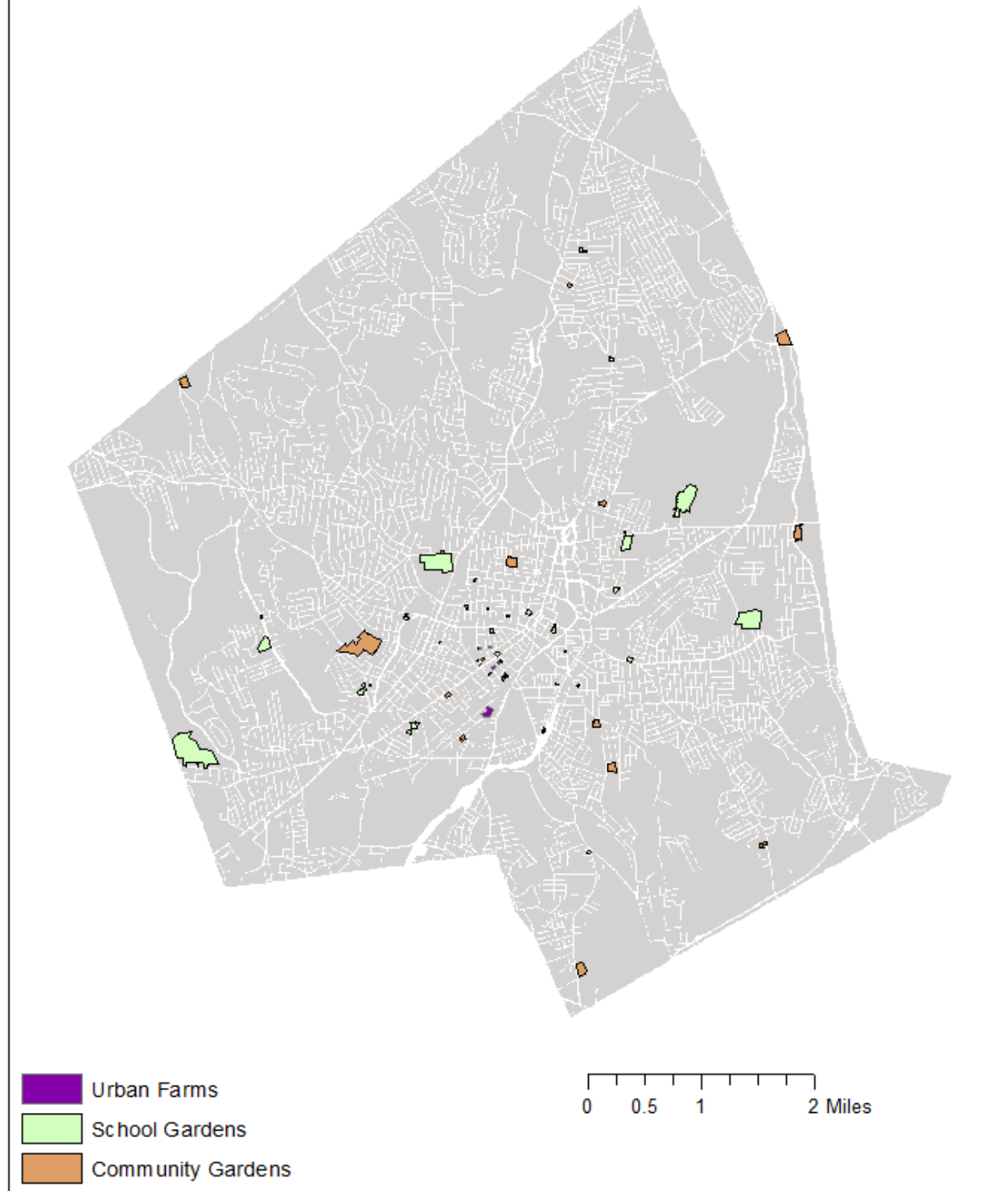


Figure 2: Current Urban Agriculture Activity in Worcester

Operating Farms in Worcester

REC Oceanic Farm

Located at 63 Oread Street, Oceanic is a 3/4 acre urban farm that serves as the Main South campus of the YouthGROW program. After several years of this property being a site of Earth Day clean ups, a group of youth and adult volunteers worked to transform the space into a community garden that could serve as the home for a new youth program in Worcester, loosely based off of the Food Project, a larger organization around Eastern Massachusetts that works with volunteers to farm over 40 acres of land. The growing capacity of the space has increased through the young farmer's efforts over the years and now the space produces over 2,000 pounds of food each summer, much of which is sold at the nearby Main South Farmers Market.

REC Grant Square Farm

Located at Grant Square Park, The Grant Square YouthGROW farm, dubbed "Fresh Roots of Bell Hill," is the newest campus of the YouthGROW program. Built through a collaboration of community partnerships including support from UMass Memorial, the Carpenters Union, Youth Build, and YouthGROWers, this garden is one year old and located within Grant Square Park. The youth maintain ten raised beds and help support the ten community beds nearby as well as building necessary infrastructure such as a shed and fencing. In year two, they plan to double the size of each of these gardens by adding an additional ten raised beds.

3.0 METHODOLOGY

The goal of this project was to raise awareness of the potential for urban agriculture in the city of Worcester by developing a publicly owned, vacant land inventory. The inventory identifies parcels that can potentially be used for food production and organizes them in an excel database. To determine relevant criteria to assess each parcel for that purpose, we conducted detailed interviews with local food production stakeholders and analyzed similar initiatives in other cities. To make the database more accessible to potential growers and those interested in urban agriculture, we linked it to mapping software. Our primary objectives were to:

- 1. Determine relevant criteria for the land inventory through discussion with local urban agriculture stakeholders.**
- 2. Analyze urban agricultural initiatives in other cities and the role of land inventories through comparative case studies.**
- 3. Develop a land inventory for the city of Worcester.**
- 4. Establish an easily accessible and usable format for the finalized database.**

Objective 1: Analyzing the interests of local stakeholders

To better understand community views regarding the potential for urban agriculture in Worcester, staff from local organizations with long standing commitments to community development and urban food production in the city were interviewed. These interviews were completed on a one-time-only, individual basis. Some of the organizations represented included the Regional Environmental Council, Lutheran Social Services, Worcester Food Policy & Active Living Council, and Worcester's community development corporations. We focused on two themes:

- The opportunities and barriers to expanding urban agriculture in Worcester; and**
- The extent to which a searchable land inventory of vacant parcels might help promote urban food production**

The interviews also helped to identify relevant criteria for a land inventory, such as parcel size, access to water, sunlight exposure, etc. The survey that was given to each interviewee can be found in Appendix A. A list of the interviewees and the transcriptions of each interview can be found in appendix B.

In order to analyze information gained from the stakeholder interviews, we recorded and transcribed each interview in a similar format. Specific responses and preferences regarding important characteristics of agricultural land were noted. Each interviewee possessed different types of knowledge relevant to their level of involvement with urban agriculture in Worcester. Some broader themes (difficulty in obtaining land use agreements, nuisance of locating suitable parcels of land, lack of policy regarding urban agriculture) were annotated in order to gain a better overall understanding of the extent of political and community support for urban agriculture in the city. This kind of information was especially beneficial when creating a list of recommendations for different groups to consider.

The information and knowledge that was gained during the interviewing process served as a foundation for the remainder of the project. Those that were interviewed not only supplied us with relevant information pertaining to Worcester and agricultural land characteristics, but they also offered us additional contacts to reach out to, resources that would be helpful during the technical stages of the project, and provided feedback and suggestions for the overall direction of the inventory. This wealth of information and resources played a vital role in the development of the vacant land survey.

Objective 2: Identify Urban Agriculture Initiatives in Other Cities and Consider their Relevance for Worcester.

Many cities have already taken measures to promote urban agriculture. The second phase of our project consisted of comparative case study analysis in which our group identified common initiatives taken by other cities that contributed to creating a successful local food production program. We focused on the following questions:

1. How were successful urban agricultural programs initiated and developed?
2. How were land inventories prepared in these cities?

Specifically, we focused on how other cities employed land surveys to establish a foundation for their respective urban agricultural programs. To summarize these initiatives, we developed a flowchart to represent the general process for a successful urban agricultural program. By undertaking this method, our group was able to identify those elements that worked best in other cities and create an outline for the city of Worcester to follow. By utilizing the flow chart method, we were able to identify land inventories as a common first step in successful urban agricultural programs around the country. This flowchart can be examined below:

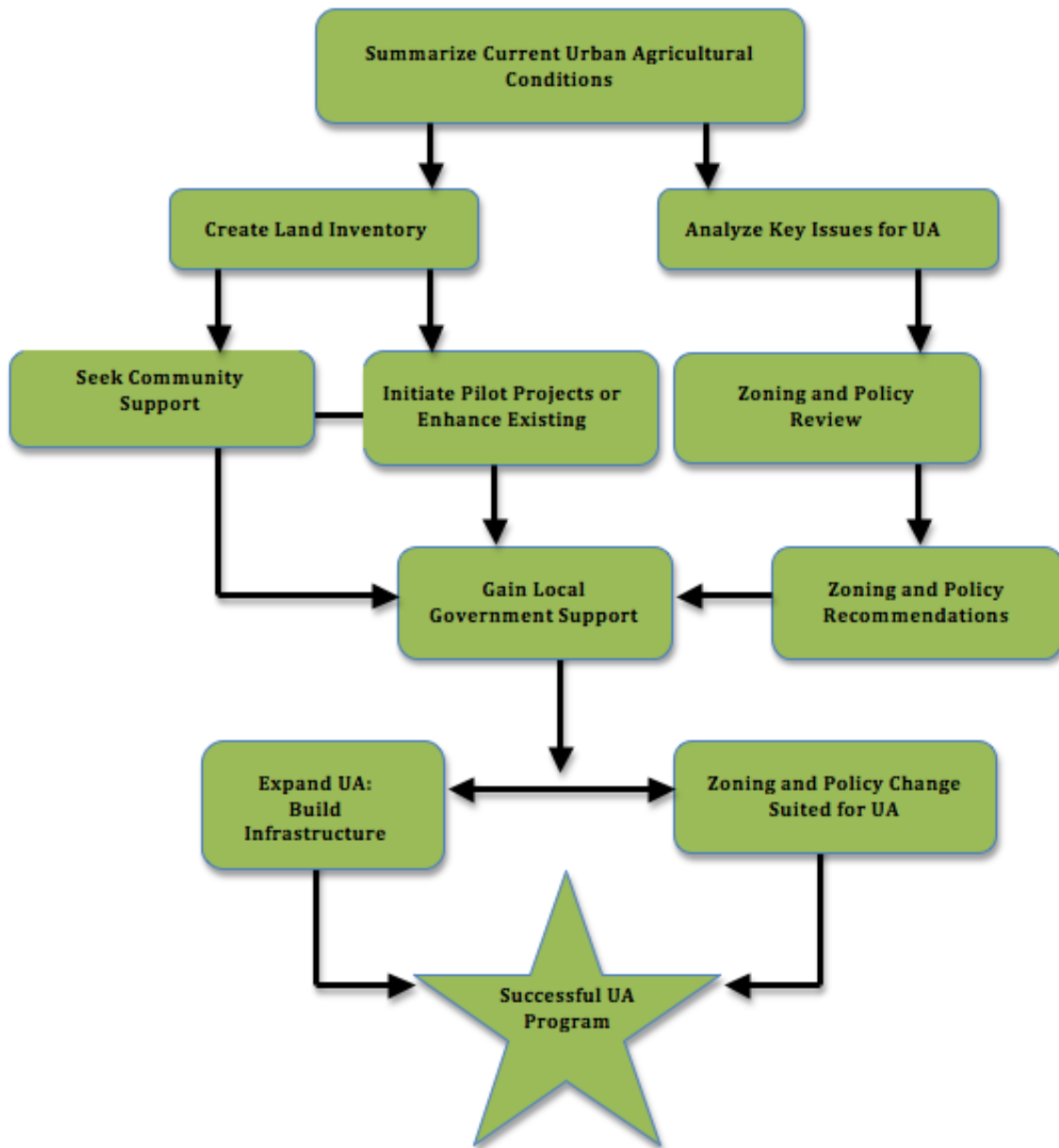


Figure 3: General urban Agriculture Success Flow Chart

The cities examined were chosen from our literature review as well as from suggestions from our project advisors, our sponsor, and members of our advisory committee. These cities included: Boston, Toronto, Providence, Portland, and Vancouver. A case study analysis for each of these cities can be found in appendix C. Additional cities such as Oakland, Seattle, Chicago, and Baltimore were reviewed, but not formally analyzed like those listed in the appendix.

The case study analysis method also served as a tool to identify obstacles that each city encountered, and the steps they took to overcome them. In our research, we also attempted to identify how each city promoted their programs and how they were able to gain community support.

Through our case study analyses, we intended to demonstrate the need for reform in Worcester and that a land inventory was the necessary first step toward increasing local food production. The information gained from the case study analysis phase of the project supported and built upon the knowledge gained from the interview component of the project. This served as a transition to begin work on our next objective, completing a vacant land inventory of Worcester.

Objective 3: Develop an Inventory of Publicly Owned, Vacant Land

The primary goal of this inventory was to identify the potential land opportunities available for urban agriculture within the city of Worcester. We recognized that there is space available in Worcester that could be retrofitted to accommodate the specific needs of urban agriculture. Rooftop growing, hydroponics, and demolishing vacant buildings for the use of the land and soil are all valuable avenues that can be explored for the use of local food production. This project, however, focused solely on making use of underutilized or vacant parcels for crop production. We also realize that there are vacant, private land opportunities available in Worcester; however this inventory only contains publicly owned parcels. These public parcels were either owned by the city of Worcester and its different public organizations (i.e. Schools Department, Parks and Recreation Department, Worcester Conservation Commission), or the state of Massachusetts. Ultimately, this land inventory catalogued land for

the purposes of assessing which public, vacant parcels would be suitable for different agricultural uses.

In completing this land inventory, we utilized ArcGIS software and the city of Worcester’s Parcel Data. “GIS is a computerized program that allows for a wealth of information on land to be mapped so that a visual representation of the land in Worcester can be produced to allow for analysis” (Kelley, Sarraf, & Walsh, 2004, pg. 28). This software allowed us to efficiently survey the entirety of Worcester’s public parcels, as well as aided us in visual classification of each site.

Before using the software, we first needed to study examples of those that had used it previously for the same purposes. We examined efforts such as Oakland’s “Cultivating the Commons” and Portland’s “Diggable City” projects, which helped us to design a methodology that could be adapted specifically to the city of Worcester.

With the help of our advisor, Professor Suzanne LePage, we were able to learn the logistics and abilities of ArcGIS so that we could utilize it for the purposes of a vacant land inventory. We then selected criteria for assessing vacant land parcels based on examples from other successful agricultural land inventories, as well as from our interviews. These criteria included qualities such as size of the parcel, land coverage, access to water, and slope. These criteria served to help us create an “empty database” that could then be filled using ArcGIS software in conjunction with city of Worcester parcel data. An example of the spreadsheet categories can be seen below:

Table 2: Excel Database Example

MAP_PAR_ID	PROPZIP	OWNER	RODYEAR	RODBOOK	RODPAGE	AREA_SF	AREA_VALUE
23-019-00002	01605-1228	COMM OF MASS EDUCATION	1970	05078	59	2182976.00000	31068400.00
52-007-00001	01606-1219	CITY OF WORCESTER SCHOOL DEPT	1988	00000		696960.00000	5060500.00

ZONE_ZONE_NAME	X_COORD	Y_COORD	HOUSE_NO	STREET	LND_VALU
RL-7 SINGLE-TWO FAMILY RESIDENTIAL 7000 SQ FT LOT MINIM	576779.33288	2939863.77847	0	Hyde ST	20463700.00
BG-2. GENERAL BUSINESS USES 2-1 FAR RESIDENT USES	582583.41215	2938902.88174	280	CLARK ST	0.00

BLD_VALU	VACANT	GROUND COVER	ACCESS TO WATER	SOIL CONTENT	SUNLIGHT EXPOSURE
10604700.00	YES	GRASS			
5060500.00	PART	VEGETATED			

PARKING	SLOPE	DENSITY	WASTE DISPOSAL	ACCESS TYPE	SAFETY

Following suit with the methodologies from the cities of Portland and Oakland, our task was further defined into three categories:

- 1. Conduct an assessment of all the land currently being used in the city for agricultural purposes.**
- 2. Assess all the land that could potentially be useful for urban agriculture within the city limits.**
- 3. Design site profiles that give a more detailed description of each parcel concerning characteristics such as ownership, zoning, and size.**

In undertaking the first task, we identified existing community gardens and urban farms in Worcester. Stacie Brimmidge of the REC, one of our advisory committee members, provided us with a comprehensive list of community gardens and farms along with their addresses, which were then imported into ArcGIS, and used to create a detailed map of the locations of current farming operations in the city.

To create the actual inventory, we first obtained the city of Worcester's Parcel Data from the city's GIS department. These maps clearly identified all of the different parcels that comprised the city. We then filtered the map to identify publicly owned parcels throughout the city. This land was owned by city or state agencies and was easily identifiable in the "ownership" column of the attributes table for the parcel layer. Using these parcels, we created a new layer and proceeded to visually classify each parcel to determine whether or not it was vacant. In order to accomplish this, we overlaid satellite imagery from the National Agriculture Imagery Program. The purposes of this imagery are specifically geared towards classifying agricultural land, and the imagery used was the most recent available on the NAIP website, (2012). The program captures aerial imagery during the agricultural growing seasons in the continental U.S. These maps are available for free download through the USDA Geospatial Data Gateway. We also cross-referenced these images with street view images from Google Earth for the purposes of obtaining the most accurate depiction of the parcel. Additionally, we assessed the ground cover of each vacant parcel and labeled each parcel accordingly by creating a new column in our database. The criteria we used to classify each parcel can be seen below

Table 3: Ground Cover Criteria

Category	Description
Vacant	Land in question had no man-made improvements and appeared to be in a state of disuse.
Partially Vacant	Greater than 25% of the parcel appeared to be vacant, and the remainder of the parcel contained man-made improvements
Grass Surface	Parcels containing more than 50% by area grass surfaces.
Forest Surface	Parcels containing greater than 75% of forested surface.
Forest/Grass Surface	Parcels containing approximately >25% grass surface by area and <75% forested surface by area.
Vegetated	Parcels containing more than 75% dense vegetation surface by area. Dense vegetation is to include thick underbrush.
Grass/Water Surface	Parcels containing >75% grass surface by area as well as a natural body of water.

Next, we created a new layer of vacant and partially vacant parcels. We were able to further filter this layer to organize different types of vacant land into new categories based off of the descriptions in the table above. Each of these new classifications then turned into a layer of its own so that, for example, the map of Worcester could be shown with just forested, vacant, publicly owned properties, or just school owned, vacant, public properties. These layers were created for the purpose of organizing the parcel data more concisely. Creating this separation allowed us to move into the final phase of the project and begin analyzing the parcels that made up our database. The figure below is a visual representation of the GIS process that was adapted for this project:

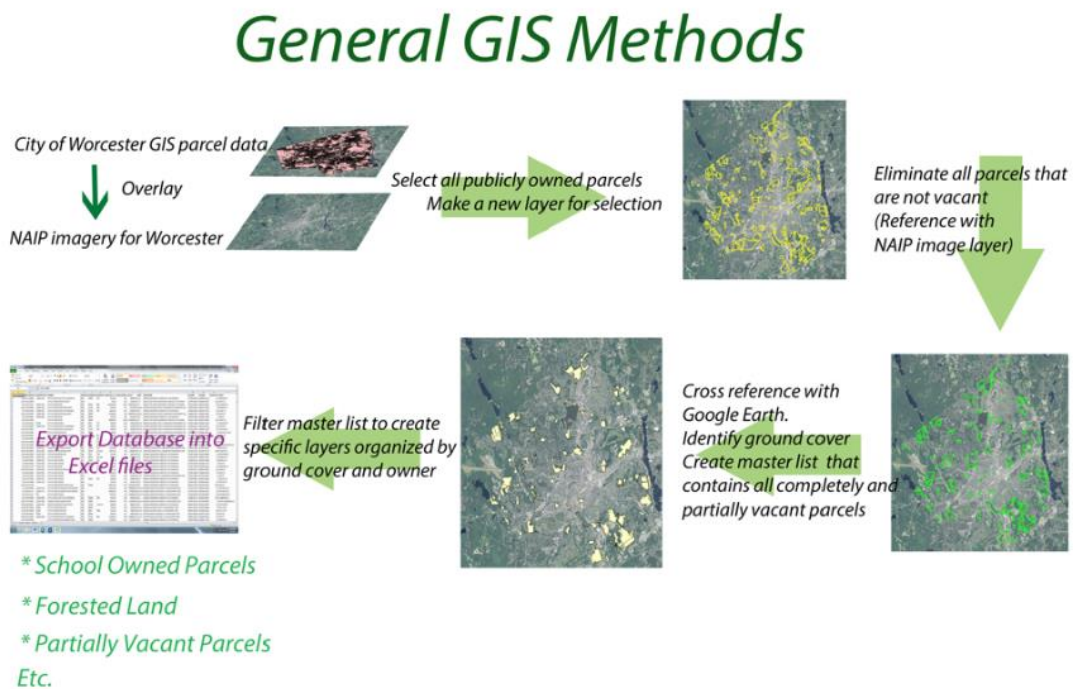


Figure 4: General GIS Methods Flow Chart

Objective 4: Finalized Database

It was determined through our research that Microsoft Excel would be the simplest and most accessible way to convey our findings to urban agricultural stakeholders. Populating these spreadsheets with information from the ArcGIS maps was the last step in creating a final deliverable. Following this, we exported the attributes table from each of our layers into

Microsoft Excel files. Multiple excel spreadsheets were created to differentiate between the different types of vacant land that is available in the city. For example, one of these spreadsheets was titled “Vacant School Owned Land in Worcester.” Unfortunately, we were unable to fill in every column for each parcel due to time constraints. To address this problem, the site profiles which are explained in the next paragraph, elaborate on those specific characteristics. In this way, others after us can pick up where we stopped and have clear examples to draw from.

Since the attributes table for the parcel layers already contained a wealth of information from the city’s GIS office, we were able to identify the area of each parcel, as well as ownership, zoning, and other important qualities of the land that were relevant for urban agricultural stakeholders. This information was then incorporated into individual site profiles. Through the use of a small text box, we could list important characteristics of each site relevant to urban agriculture. These site profiles also contained imagery from Google Earth that outlined the parcel, as well as photographs taken from site visits. Due to the immense number of vacant sites in Worcester that were suitable for agriculture, this aspect of the project was limited to creating site profiles for 17 sites. The site profiles that were created served to visually represent the variability in the different types of vacant parcels available in the city. An example site profile page from Portland’s ‘Diggable City’ Initiative is shown below. It served as a template for the site profiles completed in this project:



Potential Uses:

Highly accessible by all modes of transportation, the R5 zoning of this site currently prohibits agricultural use. While a community garden is permitted, the site characteristics do not lend themselves well to this type of use. The City of Portland’s Community Gardens Program has established site visibility as key criteria for a successful community garden. The site is bound by railroad tracks and a steep ravine and is frequented by a local homeless population. Establishing an agricultural use on this site would require strong neighborhood enthusiasm and interest.

Agency	WATER
Acres	3.1
District	North
Zoning	R5
Bus Route(s)	40 Mocks Crest
Surrounding Uses	SFR and MFR, railroad tracks
Access	Good pedestrian access, adjacent bike trail

Existing Conditions:

The water tank on this site is unused and the bureau does not have a plan to use the site for the next 60-80 years. The property is adjacent to the Peninsula Crossing Bike Trail, a quarter mile from the nearest busline and has nearby parking. The site is also frequented by the local homeless population but this has not presented a major problem to the neighborhood.



Figure 5: Example Site Profile from Portland

Examples of the site profiles that were created can be seen in the results section of this report. Additionally, we were also able to devise recommendations from the data we collected for the city of Worcester pertaining to policy decisions regarding the future direction of Worcester’s urban agricultural program.

4.0 FINDINGS

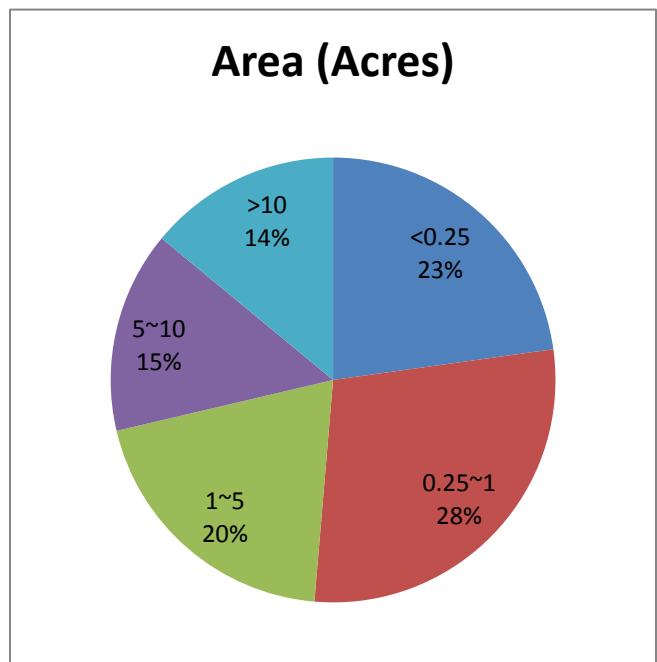
4.1 General Findings

We identified roughly 2553 acres of vacant land (including parcels which were partially developed) on 337 independent parcels. These parcels were distributed relatively evenly across the city, but the large and completely vacant parcels are located mainly on the outskirts of the city.

88 of the parcels are small parcels less than a quarter acre in size. 80 parcels have an area between a quarter and one acre, totaling 52.82 acres. These types of parcels would be best suited for community gardens or small market gardens run by local urban agricultural organizations. 70 of the parcels are between one and five acres in size. 26 parcels in the inventory were found to be between five and ten acres in sizes, totaling a combined area of 386.34 acres. These are the type of properties that would be best suited for multiple community or market gardens run by local urban agricultural organizations or even small-scale urban farms. The remaining 68 parcels were properties larger than ten acres, 3 of which are larger than 100 acres. Parcels of this size could be developed as urban farms or leased to commercial farmers for large-scale food production, depending on current site conditions and the feasibility of acquiring the land.

It was found that there were several primary owners for the majority of the public, vacant land in Worcester. The Worcester Conservation Commission owns 74 parcels, with a combined total area of 359.65 acres. The City of Worcester owns 55 parcels, totaling 512.58 acres.

Schools in Worcester, which were either public schools or public colleges, own a combined 46 parcels, which net 383.92 acres. The parks department in Worcester claims 23 parcels, with a



combined size of 232.32 acres. Others owners of vacant, public land in Worcester are the Commonwealth of Massachusetts Highway Department (27 parcels, 132.62 acres), the Greater Worcester Land Trust, who has expressed some interest in perhaps partnering with local urban agricultural organizations to allocate some land for agricultural purposes (17 parcels, 218.46 acres), City of Worcester EOEND (10 parcels, 4.76 acres), Worcester City Manager (12 parcels, 28.44 acres), City of Worcester Tax Title Custodian properties (15 parcels, 7.7 acres), and the Airport Industrial Park (7 parcels, 127.03 acres). There are several other minor owners who claim the remaining vacant parcels in the inventory (55 parcels, 554.25 acres) and these owners can be found in detail in the Microsoft Excel database files in Appendix F.

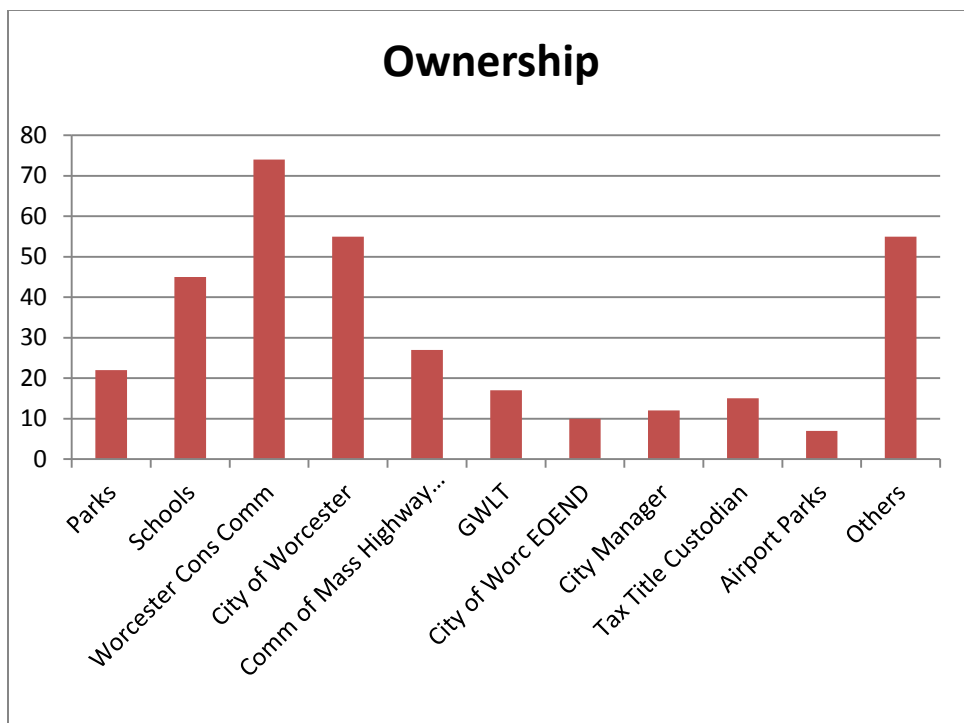
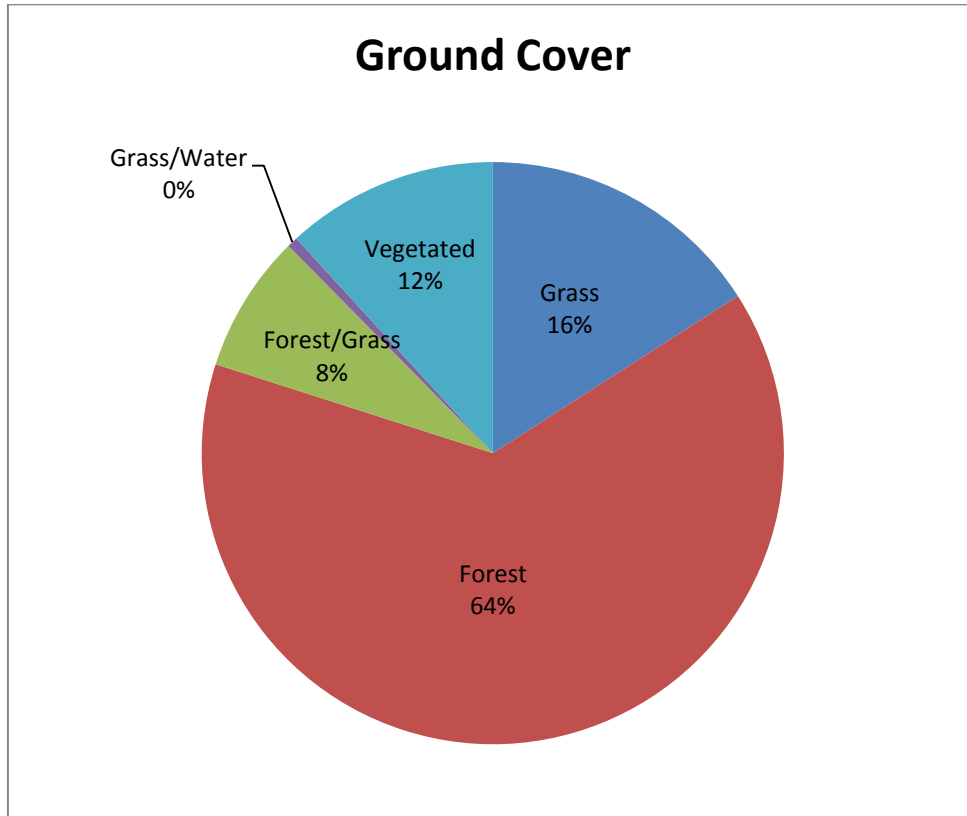


Figure 6: Ownership of Vacant Parcels in Worcester

By cross-referencing each GIS parcel with NAIP Imagery and recent Google Earth street view images, we were able to categorize all of the vacant, publicly owned land into 5 main categories according to ground cover of the open space. They were Grass, Forest, Forest/Grass, Vegetated, and Grass/Water. Only 2 parcels were identified as Grass/Water. 217 of the potential parcels were forested and made up the majority of the inventory. 26 parcels

were classified Forest/Grass property. Grass primarily covered 54 parcels. Lastly, 40 of the properties were deemed to consist of vegetated land.



When sorted by zoning classification, there were 4 parcels zoned as airport district, 34 for business use, 18 for manufacturing use, 3 for institutes such as hospitals or schools, and the remaining 286 parcels were zoned for residential use.

The following pages are a visual representation of the data that was gathered above. These maps were developed from the GIS program:

Vacant Publicly Owned Properties in Worcester

Below is a map of completely vacant and partially vacant publicly owned parcels in Worcester. Vacant land does not have any type of development or man-made improvements. This map was generated by visually classifying each parcel cross-referencing NAIP imagery (2012) with GoogleEarth street view images (2010).

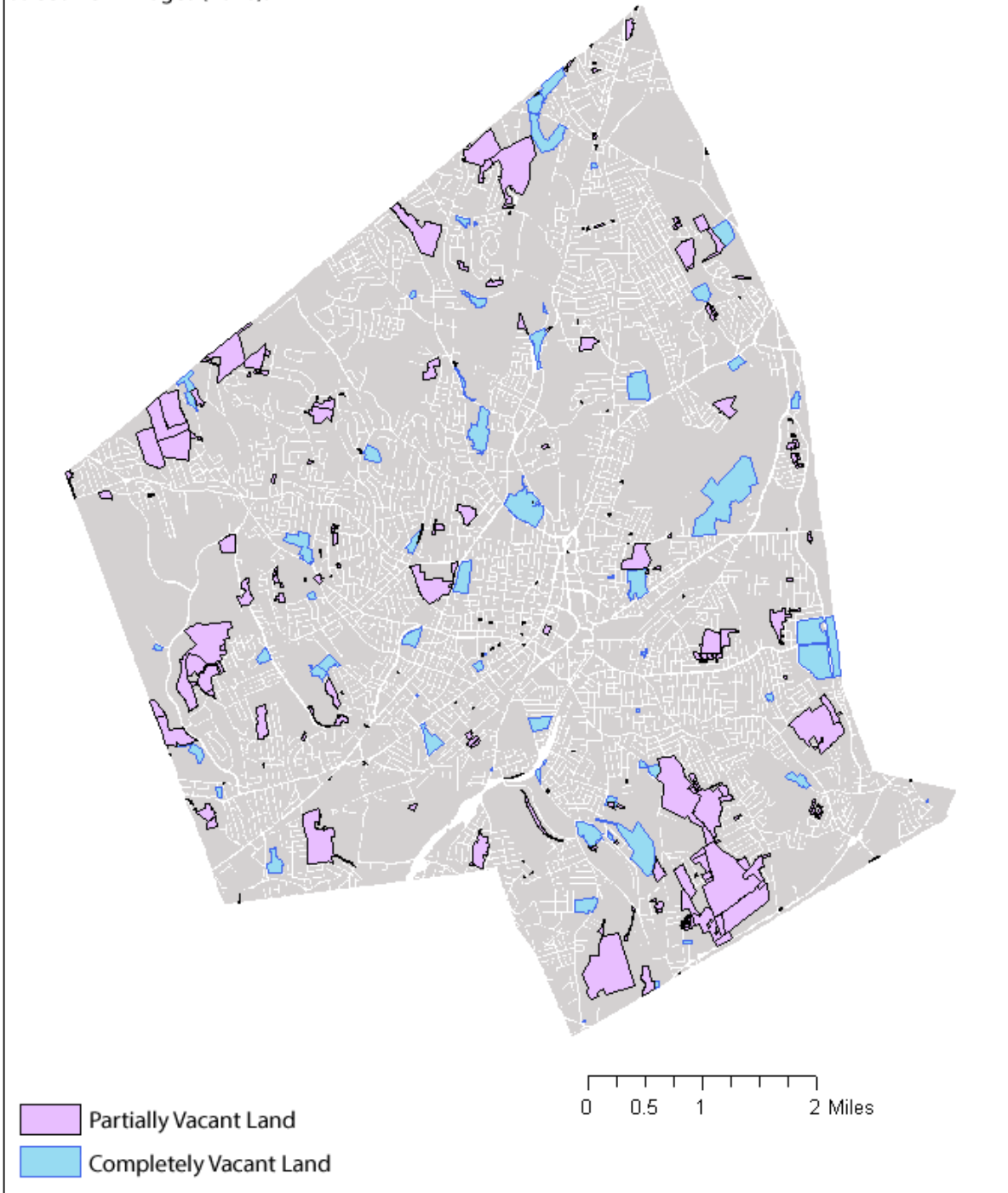


Figure 7: Vacant Publicly Owned Properties in Worcester

Ground Cover Distribution of Vacant Publicly Owned Land in Worcester

Below is a map of the publicly owned vacant land in Worcester categorized by their individual ground cover. This map was generated by visually classifying each parcel cross-referencing NAIP aerial imagery (2012) with Google Earth street view images (2010).

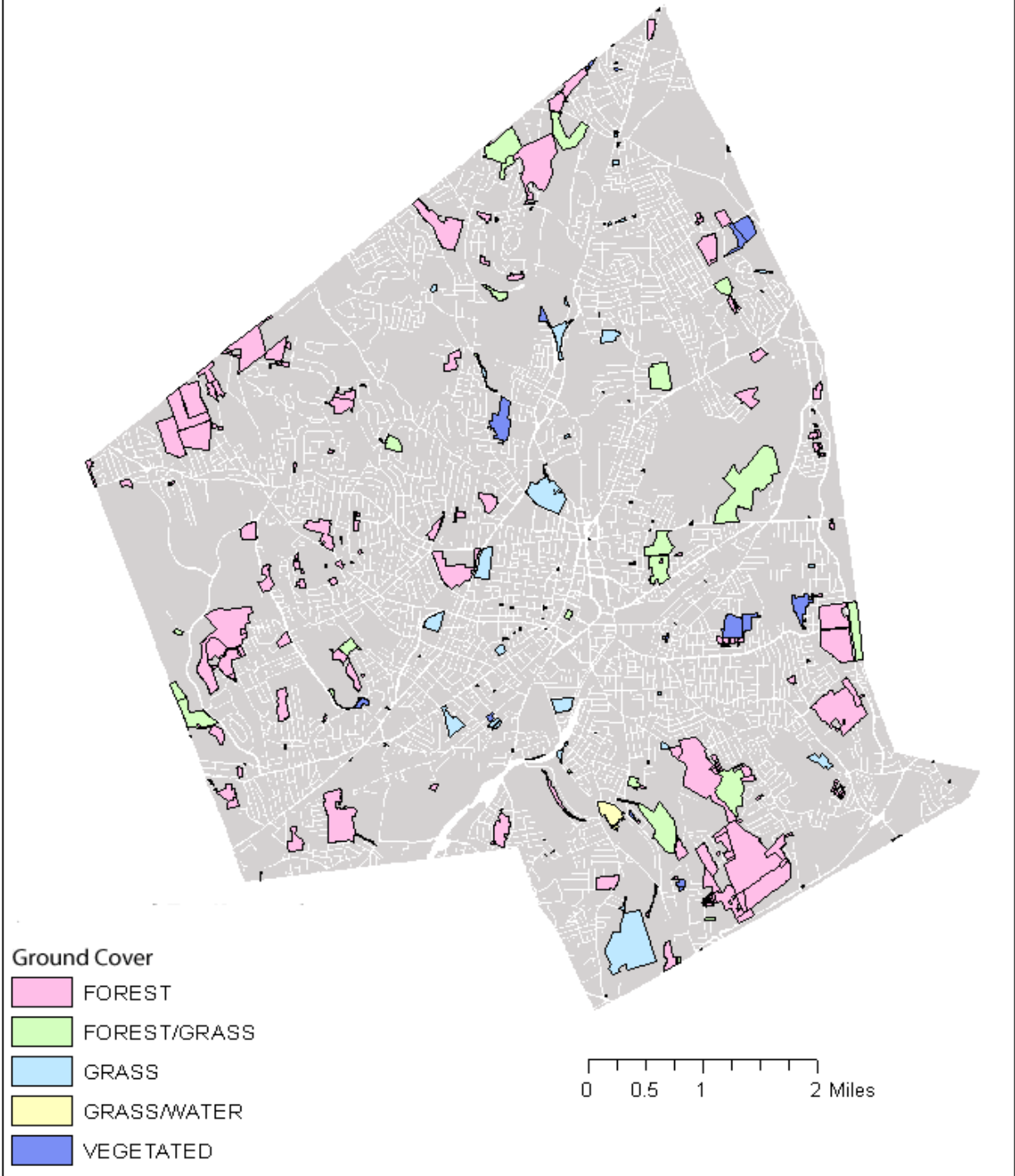


Figure 8: Ground Cover Distribution of Vacant Publicly Owned Land in Worcester

Vacant School and Park Properties in Worcester

Below is a map of properties that are owned by the schools and parks in Worcester. This map was generated by cross-referencing the ownership column from the GIS parcel data for Worcester with the list of vacant publicly owned land.

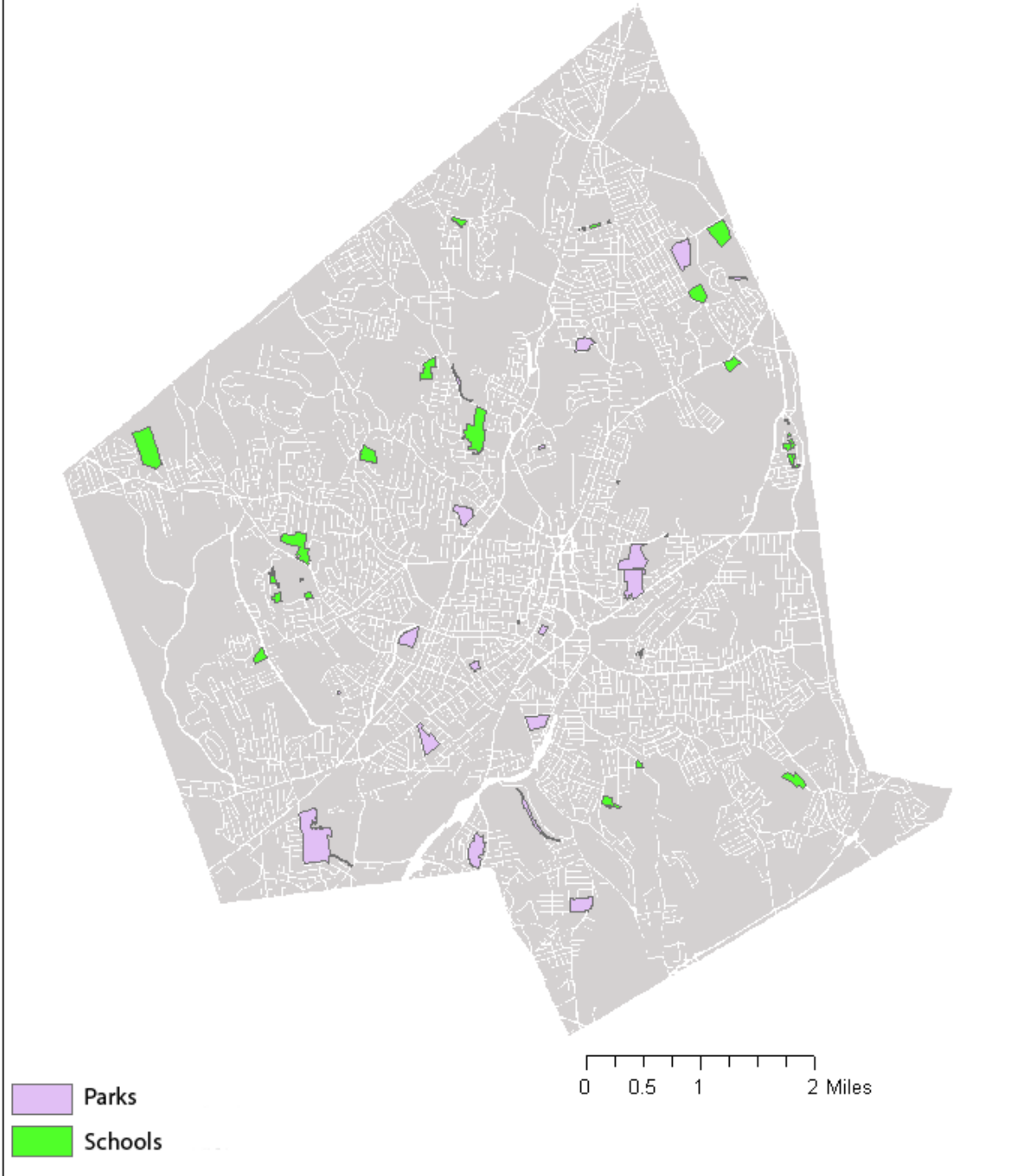


Figure 9: Vacant School and Park Properties in Worcester

Zoning Distribution of Vacant Publicly Owned Land in Worcester

Below is a map of the publicly owned vacant land in Worcester categorized by zoning code. This map was generated by cross-referencing the zoning column from the GIS parcel data for Worcester with the list of vacant publicly owned land.

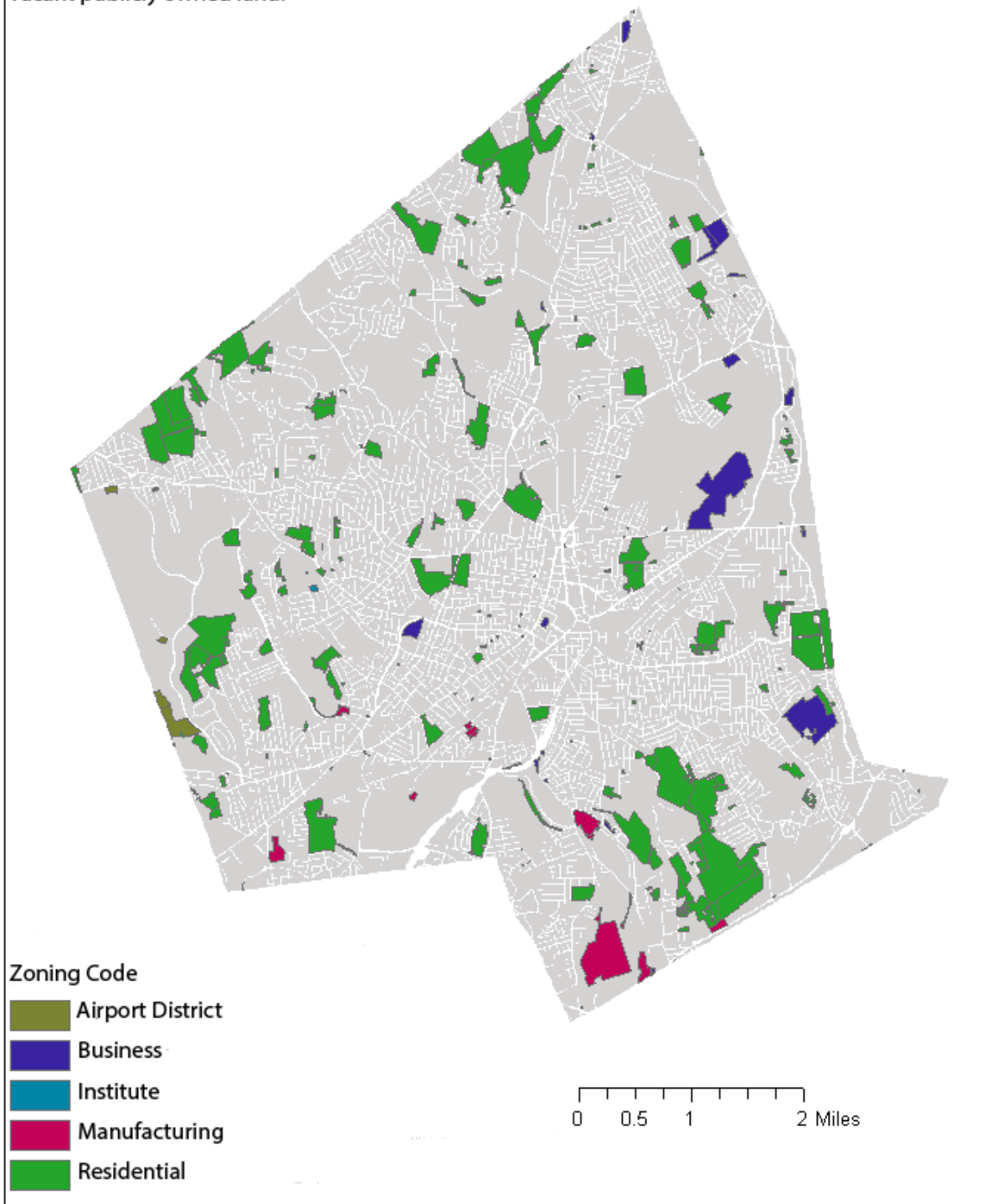


Figure 10: Zoning Distribution of Vacant Publicly Owned Land in Worcester

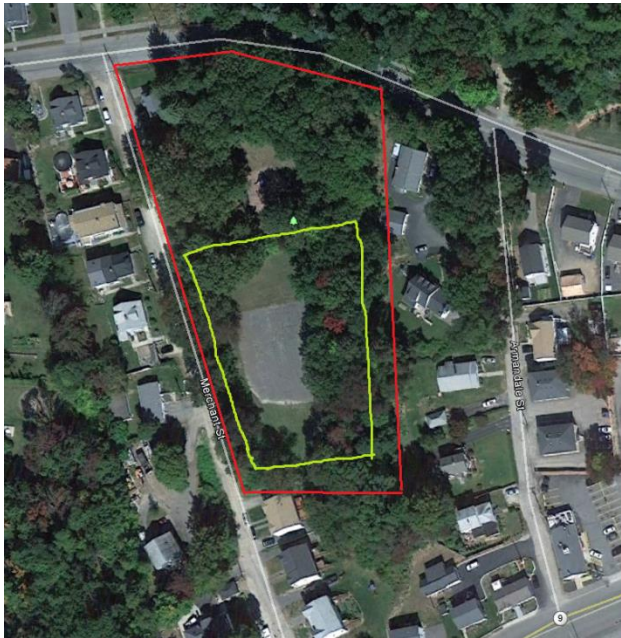
4.2 Site Profiles

The following pages consist of individual site profiles for 8 of the 337 potential sites in the inventory. In order to completely understand the true potential for a site to house some type of urban agricultural activity, it is imperative that all of the vacant sites be ground-truthed. The sites that were profiled in this inventory vary in size, location, and ground cover, as a means to accurately represent the variability of public, vacant land in Worcester. The sites are numbered so that anyone can find the profiled sites on the master list for vacant parcels in Worcester. These site profiles contain a write-up on observations from the site visit that may be relevant for urban agricultural practice on the land, as well as two photos. One photo was taken upon visiting each site and serves to represent the current condition of the land. The second photo is an aerial image of the site that contains both the entire parcel outline in red and in some cases a smaller outline within the parcel in green that represent the portion of the site that we focused on and has potential for urban agricultural activity. Lastly, each profile contains a data box that lists important qualities of each type of land that should be noted upon first inspection of a property.

As mentioned previously, these profiles only intend to illustrate in greater detail the potential for some of Worcester's publicly owned, vacant properties. At this time, no strides have been taken to procure any of these sites or the sites in the inventory for urban agricultural purposes. There are many steps that must first be taken before establishing community gardens or urban farms on any of the sites that are identified in this inventory or the site profiles, such as community and city support. These site profiles are intended to encourage urban agricultural stakeholders, and any others interested, to further investigate potential sites.

0 Apricot St. (Apricot Street Playground)

Located next to Apricot playground, this is a sizeable vacant lot that is zoned for single family residential use. Approximately two thirds of the lot is covered by what appears to be old tennis or basketball courts while the remainder of the plot is covered in grass. The entire area has trees on all sides, which contribute greatly to the seclusion of the parcel. Despite the trees, the entire area appears to be relatively exposed to sunlight throughout the day. There is a steep bank from the road down to the lot which drops approximately 20 feet, and gives the lot a “valley” effect. Water access should be simple due to the residential area and on street parking is readily available. The soil quality is most likely not an issue due to the relative seclusion of this parcel. Currently the lot is only accessible by two walking paths and vehicle access is not possible. If the pavement were removed this parcel would hold great potential for use as an urban farm, however community support should be determined before attempting to implement any kind of agricultural activity.



OWNER	CITY OF WORCESTER
AREA (ACRES)	2.3
ZONE	RL-7
VACANT	PARTIALLY
GROUND COVER	GRASS
POTENTIAL USE	URBAN FARM



0 Millbury St. (Worcester-Providence Turnpike)

This parcel is a large, flat grassy area that is zoned for general manufacturing. There is a canal that bisects the property, and the entire area has excellent sunlight exposure. Soil quality may be questionable due to the close proximity to the highway and the railroad. There is a smaller parcel that is publicly owned on the other side of McKeon Rd. that is also bisected by the canal. Clearly, access to water should not be an issue. There is no off street parking and there is a footpath that extends along the perimeter of the property. The site is currently owned by the State of



Massachusetts Highway Department and appears that it has been in disuse for an extended period of time. It could serve as a good candidate for a community garden.



OWNER	COMMITTEE OF MASSACHUSETTS HIGHWAY DEPARTMENT
AREA (ACRES)	22.84
ZONE	MG-2.0
VACANT	PARTIALLY
GROUND COVER	GRASS/WATER
POTENTIAL USE	COMMUNITY GARDEN

7 Jaques Ave. (Chandler Elementary School)



This is a small grassy plot zoned for general residential use with a foot path through the middle. It is located across the street from Chandler Elementary Community School and approximately one block from the Murray St. farmers market. The parcel is currently scattered with trash due to its heavy pedestrian use. Sunlight exposure is decent due to the space between surrounding building and the lot. There is a slight slope away from Ethan Allen St. The fact that there is no existing fence combined with the location of this parcel in the city could result in vandalism if the parcel were to be utilized. Water access should not be a problem; there is actually a fire hydrant on the corner of the lot. This parcel holds good potential for use as a market garden due to its proximity to the existing farmers market.

OWNER	CITY OF WORCESTER EOEND
AREA (ACRES)	0.33
ZONE	RG-5
VACANT	YES
GROUND COVER	GRASS
POTENTIAL USE	MARKET GARDEN

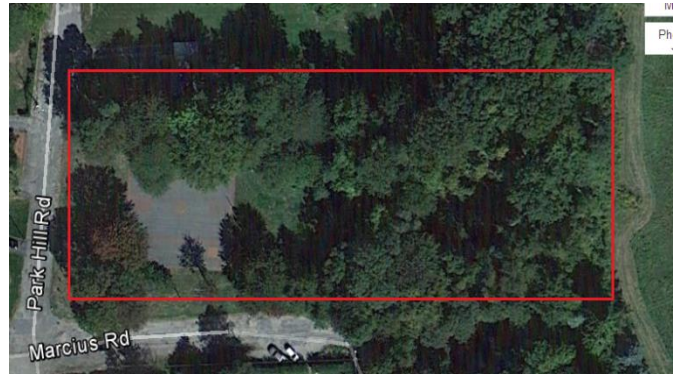


26 Park Hill Rd. (Oakland Heights)

This parcel is zoned for single-family residential use, which excludes agriculture. The parcel itself contains an abandoned basketball court (pavement) which is surrounded by grassy areas. This land is in a highly residential neighborhood where soil quality is likely not an issue.

The parcel is surrounded by few trees but it appears that sunlight exposure is still decent. On street parking is readily available and the slope of the parcel is negligible. If the court were torn up, this parcel would have potential for

use as a small-scale urban farm. Before this could happen, community support would need to be gauged, pertaining to the actual use of the court.



OWNER	CITY OF WORCESTER
AREA (ACRES)	1.46
ZONE	RS-7
VACANT	PARTIALLY
GROUND COVER	FOREST/GRASS
POTENTIAL USE	SMALL SCALE URBAN FARM



49 Canterbury St. (South Worcester)

This land is zoned for general manufacturing use. The lot itself appears unkempt and is covered by dense underbrush. The lot is surrounded by fences on all sides and actually has fences running through the middle. There is trash scattered about the property and soil quality will most certainly be an issue with this parcel, as the property adjacent to it seems to have housed and industrial building in its past that has since been demolished. Despite this, there is excellent sunlight exposure and there is no slope. Prior uses of this property should be explored, as it appears there may have been a building on the parcel at some point. If this lot were to be revitalized it could serve as a good urban farm.



OWNER	CITY OF WORCESTER EOEND
AREA (ACRES)	1.74
ZONE	MG-2.0
VACANT	YES
GROUND COVER	VEGETATED
POTENTIAL USE	URBAN FARM



85 Shore Dr. (Shore Park)

This property is zoned for single-family residential use, which excludes agriculture. The parcel is a large grassy area enclosed by Indian lake on one side and Shore Dr. on the other. It is located next to Shore Park and the sunlight exposure appears excellent. Shore Dr. seems to have a heavy volume of traffic so soil should be tested before agricultural use. The entire area is flat with the exception of the banks leading toward the water which are quite steep. There is a footpath on the lake side of the parcel and the park provides for limited parking spaces. This land would be an excellent candidate for use as a small scale urban farm due to its proximity to the park, and the current condition of the property itself.



OWNER	CITY OF WORCESTER
AREA (ACRES)	6.8
ZONE	RS-7
VACANT	PARTIALLY
GROUND COVER	FOREST/GRASS
POTENTIAL USE	SMALL SCALE URBAN FARM



670 West Boylston St. (Quinsigamond Community College)

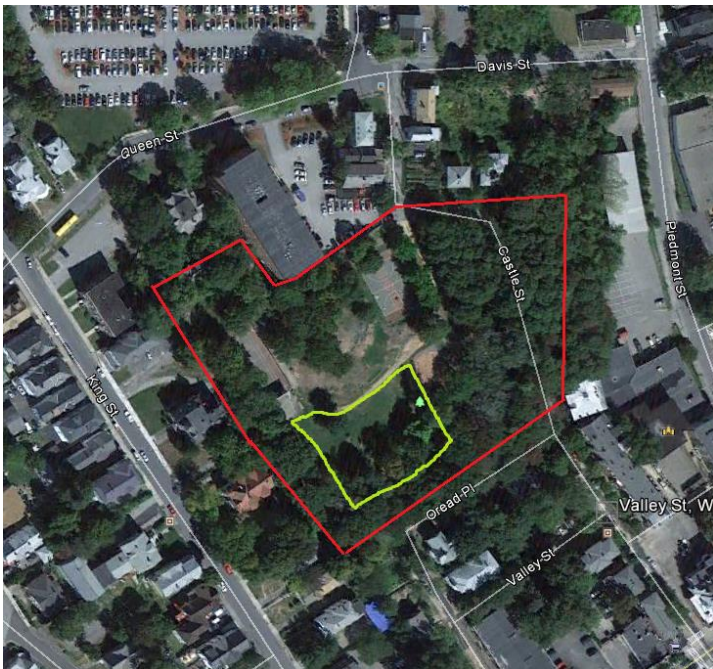
This sight is actually located at the end of Emerson Drive on the left hand side. It is currently zoned for single-two family residential, which does not allow for agriculture. The parcel is entirely covered in grass and borders 12 parking spaces on one side, individual residential houses on two sides, and a road on the other. The soil on this site should be tested but does look promising. The parcel is contained in the grounds of Quinsigamond Community College and has excellent sunlight exposure. The parcel is entirely flat except for a steep bank that is approximately five feet in width near the parking spaces. The closest non permit parking is approximately 200 feet away. This property appears promising for use as a large-scale school garden or a small urban farm.

OWNER	COMMUNITY OF MASSACHUSETTS EDUCATION
AREA (ACRES)	50.11
ZONE	RL-7
VACANT	YES
GROUND COVER	GRASS
POTENTIAL USE	SCHOOL GARDEN



20 Alden St. (Oread Castle Park)

This is a public park located atop a small mountain in an area zoned for general residential use. The park contains tennis, basketball, and squash courts along with a children's jungle gym area. The park appears to be frequented by some of the lower income residents from the area and security may be an issue. There are very few opportunities for parking near the site. Sunlight exposure is excellent. Unfortunately, it appears that water access may be difficult. It should also be noted that this parcel is located adjacent to the Regional Environmental Council's Oread Place Community Garden.



OWNER	CITY OF WORCESTER PARK DEPARTMENT
AREA (ACRES)	3.12
ZONE	RG-5
VACANT	PARTIALLY
GROUND COVER	GRASS
POTENTIAL USE	COMMUNITY GARDEN



5.0 RECOMMENDATIONS

Short Term:

Complete Land Inventory to Include Private Land

Due to time constraints, privately owned, vacant land was unable to be addressed in this land inventory. From our research, it was clear that privately owned land holds the same potential for urban agriculture as public land, yet it comes with its own unique set of challenges. Therefore, a survey of privately owned vacant land for the purposes of furthering urban agricultural opportunities should be completed in the city of Worcester. It is our recommendation that the city partners with a group like New Entry Sustainable Farms, as they specialize in working with cities and towns to find suitable, privately owned agricultural land. Additionally they proactively work with the city, landowners, and farmers to develop lease agreements on an individual basis. From our GIS visual classification results, it was evident that there was an abundance of privately owned, vacant land that should be catalogued in order to properly assess the full potential for urban agriculture in Worcester.

Complete Site Profiles for Public and Private Land Surveys

The site profiles that were created for this project are an important piece in understanding the information that was gathered in our database. These profiles synthesize a vast amount of information in a compact, visual format that allows stakeholders to quickly examine the qualities and characteristics of individual pieces of land. The site profiles in this report served to represent the variety of different types of vacant land one might encounter in the city. Therefore, it is our recommendation that these site profiles be created for the remainder of the parcels listed in this land inventory database. Without ground-truthing (such as site visit photos and in-person assessment) the individual parcels in the spreadsheets, it is extremely difficult to perceive the potential uses for each piece of land. Land may appear arable in satellite imagery, but only through ground-truthing will one be able to assess the actual potential of a site for urban agriculture. Additionally, site visits will also help to determine the exact locations of parcels that may not have unique addresses in the GIS attribute table.

Make Use of Land Surrounding Worcester for Agricultural Purposes

As a short-term solution to importing food from around the globe, we suggest that urban agricultural stakeholders focus their efforts on growing more food outside the city where land may be more readily available. An example of this type of initiative is already being implemented by Lutheran Social Services of Worcester on their New Lands Farm in Sutton MA, fifteen minutes outside of the city. This organization farms on two acres of a sixty-four acre plot of open land, and brings their produce into the city to sell at local farmer's markets. If more organizations were to take this approach and surround Worcester with agricultural activity, it is likely that the agricultural movement will eventually take root within the city as well. This will serve as a temporary solution while the city works toward building infrastructure to support urban agriculture.

Ensure Continued Perpetuation and Availability of This Report for Urban Agricultural Stakeholders

This completed land inventory serves as a useful tool for those looking to farm within the city. Ensuring that this report is available to all interested parties is critical in accomplishing the overall mission of the project. To do this, we recommend WPI's Center for Sustainable Food Systems hosts the database on their new website, so that stakeholders may run queries or searches to identify publicly owned parcels. We also recommend that our sponsor, the WFPALC, and local urban agricultural organizations such as the REC serve as liaisons to continue distribution of this resource to any farmers or organizations looking for vacant land within the city.

The maintenance and upkeep of this project is crucial in ensuring its continued relevance. If parcels of land throughout the city are no longer being used they need to be added to the inventory. Conversely, parcels that are developed for agricultural or other uses must be removed from the inventory. In this manner the continued pertinence of the project will be ensured with regard to the current vacant parcel layout in Worcester.

Worcester Urban Agricultural Working Group (WUAWG) Serves as an Urban Agricultural Coordinator for Worcester

In our research, we observed that food policy councils have played a central role in bringing the expertise of outside stakeholders to municipal planners and politicians in many cities across the U.S. and Canada. Following these examples, we believe that WUAWG is vital to facilitating the urban agricultural movement in Worcester, as well as promoting this inventory and the acquisition of public land for urban agriculture. Currently, acquiring public land is a difficult task and knowing who to contact and how to proceed is often unclear for people or organizations looking to farm in a city. If the WUAWG were to help coordinate efforts of this sort by creating a standardized process in which people could request to make use of public land, the obscurity of the task could be drastically reduced. For example, templates for land management plans or lease agreements could serve to streamline the process for farming on publicly owned vacant land.

Long Term:

Evaluate and Reform Zoning Barriers to Allow for Increased Urban Agriculture

Currently, Worcester does not have any zoning provisions for agricultural use of land. Our research indicated that this lack of agricultural zoning serves as a barrier to the development of urban agriculture. Other cities have addressed this issue by amending their zoning ordinance to allow for agriculture to take place in certain parts of their respective cities. For example, Baltimore applied an agricultural overlay zone to city owned residential and industrial lots that had fallen into disuse, which could be an attractive option for a city such as Worcester. We recommend that Worcester identify the barriers in their zoning ordinance to urban agriculture, as well as explore options such as previously mentioned to make use of parcels that have been vacant for extended periods of time. In this manner, the land would not be dedicated to agricultural use solely, but the option would be available. As a result, the

number of vacant lots in Worcester could be reduced, thus serving to create a more economically and ecologically sustainable city.

Explore Cooperative Opportunities with Schools and Parks

Schools and Parks in Worcester represent 20% of vacant land and the REC is already making use of this land. 14 Worcester public schools are currently partnered with the REC and provide students with a safe environment to plant, grow, and learn about healthy food. This type of cooperative effort should be expanded upon and serve as a model for future agricultural endeavors in the city. We recommend groups like the REC receive support from the city, whether through a grant or staffing assistance, to develop further relationships with schools around the city and create educational agricultural programs at these schools with an abundance of vacant land. In this manner the next generation would be effectively educated about the importance of producing food locally and how doing so contributes to building a sustainable food chain.

Furthermore, parks in the city of Worcester serve as a communal space that people use for recreational purposes. It was evident that there were a number of parks in the city with open green space that generated much interest amongst our interviewees for their potential agricultural uses. The establishment of community garden programs in these local parks would be well received by those who are inclined to maintain them. We recommend that organizations seeking to promote local food production explore the potential for partnerships that could be developed with the Parks and Recreation Department for the city of Worcester.

Consider Soil Remediation of Contaminated Properties in Worcester

In Worcester, as with many other cities, much of the land that is available for urban agriculture is composed of soil with questionable quality. Many urban soils have high levels of lead or other contaminants that are the result of past land usage, the leaded fuel and paint of decades past, etc. Before farming can take place on any vacant parcel in Worcester, soil quality evaluation and possible remediation must occur. We recommend that those interested in farming in the city explore the option of phytoremediation for sites that show signs of contamination. Some plants are known as “hyper accumulators” and these plants can tolerate

high levels of certain pollutants and have the capacity to accumulate them. For example, hydrocarbons can be dealt with by pine or tall fescue, while lead can be dealt with using sunflowers or rag weed, to name a few. This is done without any excavation of the contaminated areas or waste disposal elsewhere. Phytoremediation is a less costly alternative to traditional means of soil remediation and we recommend that Worcester utilize this economical process for any parcels that are suspect for soil contamination.

Develop a Pilot Urban Farm on Public Land in the City

Currently, the only farms that are operating in Worcester are doing so under a verbal “handshake” agreement, which means there is no security for these farms and they could be forced to vacate the premises at any time. In order to create a stable foundation for urban agriculture, a pilot farm needs to be developed and sponsored by the city with assurance that the land will be solely dedicated to agriculture and be in operation for a long period of time. For example, a piece of land could be placed in agricultural preservation restriction. These farms can be used for local food production, education, and job training for anyone interested in farming within the city. This type of longevity would serve to inspire confidence among stakeholders who are not quite ready to dedicate themselves to a specific plot of land in Worcester, and would rather farm on a communal plot. We highly recommend that the city of Worcester allocate just one of the many vacant parcels in this inventory for the purposes of a pilot farm, in hopes that it will spur greater urban agricultural activity in the city.

Development of a GIS Land Locator

The WAFLPC and other urban agriculture organizations in the city should partner with WPI in the development of a public access, GIS land locator for the properties identified in this project’s database. Despite the importance and usefulness of the vacant properties that have been identified, it can be very difficult to locate a particular parcel without a visual representation to cross-reference. If the WFPALC were to guide the efforts of a future IQP team from WPI in the creation of a shared access GIS land locator, more people would be able to take advantage of the content of this inventory. Currently, it is difficult to locate a vacant parcel in the inventory without GIS access, as not all of the addresses match up to GPS or map addresses. Were WPI and the WFPALC to host some type of shared access GIS land locator,

the public would have the ability to see exactly what we saw during the course of this project, and as a result have a much easier time finding vacant, public land in the city.

Greater CDC Involvement with Urban Agricultural Groups

Community development corporations are experienced in gaining use of publicly owned lands and as such should be treated as a valuable resource in the effort to increase local food production in Worcester. For example, the Worcester Common Ground CDC (WCG) already works toward ideals similar to the aforementioned. Currently, WCG is partnered with Lutheran Social Services (LSS) in the development of community gardens and farms. WCG purchases abandoned or “unbuildable” lots from the city for reasonable prices. WCG then takes care of site maintenance, such as paying for a water line and fencing the property. They then invite groups like LSS to develop urban farms or gardens on these sites. WCG has the properties deeded as gardens in perpetuity so that the parcels may never be built upon, thus resolving the issue of land tenure for groups like Lutheran Social Services. This working partnership contributes to the development of urban agriculture in Worcester and is very encouraging. We recommend that more CDC’s explore relationships like this with different urban agricultural groups in Worcester, and incorporate urban agriculture as part of their mission.

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APPENDIX A: LAND INVENTORY ANALYSIS SURVEY

Please take a few moments to go over the following qualities concerning urban land. We realize that this is not an all-encompassing list so if we have missed something that concerns your organization please make a note of it so we can discuss this quality further in our meeting. We are most interested in your take on these qualities specifically because of your role in developing urban agriculture in the city of Worcester. We ask that you answer each question specifically with your organization's needs in mind rather than thinking of urban agricultural needs in general. Thank you for your time.

Ownership: 1 being highly unfavorable and 5 being very preferable would you like to...

Buy or rent Private land: 1 2 3 4 5

Buy or rent Public land: 1 2 3 4 5

Buy tax foreclosed properties: 1 2 3 4 5

Use government land with permission: 1 2 3 4 5

Location: 1 being unimportant and 5 being very important, please rate the following aspects of location regarding urban farms.

Distance from buyers: 1 2 3 4 5

Distance from consumers: 1 2 3 4 5

Distance from farmers: 1 2 3 4 5

Distance from water resources: 1 2 3 4 5

Access to compost: 1 2 3 4 5

Land Characteristics: Please rate the following characteristics of land with 1 being of little importance and 5 being very important regarding growing.

Soil content (i.e. type of soil, contamination): 1 2 3 4 5

Sunlight exposure: 1 2 3 4 5

Water content (moisture): 1 2 3 4 5

Terrain (i.e. hills, flat land, etc.): 1 2 3 4 5

Size of parcel: 1 2 3 4 5

Zoning of land

(residential, commercial, industrial): 1 2 3 4 5

Level of Development: Please rank the following levels of development of urban land from 1 to 6 with 1 being your first choice and 6 being your last choice.

Wetland:

Forested land:

Vegetated land (i.e. weeds and undergrowth):

Grassland:

Abandoned building lot:

Abandoned building:

Miscellaneous Questions:

- I. Explain the goal of our project to see how this correlates with their goals for urban agriculture in Worcester.
- II. We will discuss their choices to gain a greater appreciation for why some things are important to them and others are not.
- III. What resources (i.e. databases concerning the city of Worcester) are out there that that may help to classify land?
- IV. We will also ask each participant if his or her organization is currently interested in finding a new piece of land in the city.
- V. What format would they find most useful for our project?

APPENDIX B: INTERVIEW TRANSCRIPTIONS

Joe Scully	Local Farmer in Worcester *The audio quality from Mr. Scully’s Interview was too poor to transcribe, but his knowledge was incorporated into this report.
Amanda Barker	Nuestro Huerto Farm
Ashley Carter	Lutheran Social Services
Stacey Brimmidge	Regional Environmental Council
Colin Novick	Greater Worcester Land Trust
Liz Castro	Worcester Advisory Food Policy Council
Yvette Lavigne	Worcester Common Ground
Becca Weaver	New Lands Sustainable Farms

Table 4: List of Interviewees

B-1: Interview Summary for Amanda Barker of the Nuestro Huerto Farm

Amanda Barker of the Nuestro Huerto Farm in Worcester was interviewed in person by Jay Ringenbach, Wenli Wang, and Matthew Valcourt on Wednesday, November 14th, 2012.

The interview began with diving into the survey given to Amanda beforehand. We asked Amanda's opinion on using government and private land to farm. She stated that most often it is much more straightforward to farm private and government land with permission than to use public land, due to the bureaucracy involved with public land. She also informed that there are many benefits to using public land as well. Specifically she cited that it would be awesome if a farm could take hold at Green Hill Park in Worcester. We asked Amanda if her organization had ever run into a situation where they were given permission to use a piece of land and then worked the land for an extended period of time, only to have the land ripped from beneath them because there was no security involved with the agreement. She spoke about how currently they are farming a piece of land that was issued to them essentially with a verbal agreement, and they are more or less at the will of the owner of the land. They do not have a lease, although they tried to get the decision makers at the church who own the land to sign a 5-year lease, to no avail. This is a problem that many farmers within the city run into. Landowners want full control of the land, and ultimately can choose what they want to do with it despite any agreements made with farmers.

At this point, Nuestro Huerto is a non-profit organization. She discussed her CSA and how the plan is to keep it running because it seems to be working well. She described it as an "evolving experiment". She also discussed how it is much easier that the distance from their buyers, consumers, and sellers is very minimal and that short distance between the different stakeholders is very important in an urban agriculture chain. We asked if she would be open to farming outside of the city, such as in Shrewsbury or Sutton. She replied that it would not make sense and is not part of the model to farm outside of the city. She wants to be as close to her consumers as possible, because the alternative is not as sustainable in every aspect. The time spent transporting the food from further places is also not practical and does not satisfy her organization's needs. Overall, location is an important issue that needs to be addressed in any urban agriculture situation.

Right now, Nuestro Huerto does not have the ability to be able to handle another 5 acres of land in the city, however Amanda also stated that it would facilitate them being able to hire more people, and therefore she would be able to manage one site and have another manager at another site overseeing the daily operations of the plot of land. At this point, she is not sure if expanding fulfills their mission. They would first need to sit down with their board and discuss how expansion aligns with their goals and objectives. She did state that if the church chose to nullify their land agreement with the plot they farm now, they would be open to owning another parcel outright in the city or signing a long-term lease. We then discussed their current farming operation. The land they farm now is located next to an industrial park, however their soil is not contaminated. They have had it tested two or three times by different agencies and nothing hazardous has been identified. What they ultimately decided to do when they made the agreement for the land was implement raised beds and cover the bottom with plastic, which was not a good idea. After the first year, they brought in a lot more city compost and created raised beds, made entirely of city compost. They cleaned up the site a lot, as an informal exchange with the church, to keep them happy.

We then discussed what types of land would be viable for their organization to farm on, as far as ground cover and land cover is concerned. They are not interested in aquaponics or hydroponics, as farming year 'round would leave no time for the planning aspect of farming in a city. She is very open to farming on lots with abandoned buildings or vacant lots that were previously home to some type of building. She would be very interested in working with the city to remediate those lots as well. If the city would be willing to "play that game", she would be all for it. We then asked about different types of remediation for these kinds of plots. She mentioned how Clark University has a department that deals with cleaning up hydrocarbons in soils, making hazardous elements go away. There is also phytoremediation. This type of remediation uses plants to mitigate the environmental problem. These plants have the ability to degrade and eliminate different types of soil contaminants. The REC had lead in some of their plots, and they remediated with different types of plants, which drew the lead out of the soil. Then you fill in the land with compost. We then asked Amanda if she would prefer vegetated land or grassland to farm on. A lawn is a great opportunity unless they are using chemicals for the upkeep, and then she would rather have vegetated land to clear.

We then described to Amanda how our focus for the project was still unclear. We spoke to her about our intentions to create a land inventory using GIS, along with the help of our sponsor Liz Castro. We asked her what would be important for urban agricultural stakeholders like herself, in the city of Worcester. She believes there are a lot of people that would like to grow food, but not necessarily in the same ways. Many people are interested in community gardening, but have trouble finding land. There are a lot of people that pass by their farm that ask them if they have space available to farm, such as for refugees and other people to grow. People want to do it on their own. There is also a big interest in younger people wanting to gain experience in farming, and so access becomes a big part of it. There are a great number of people without the capability of accessing any pieces of land to actually farm on. There is also a desire to get more farms located near schools or even on school land, but their just needs to be a stronger push to get more kids involved.

We then asked what kind of roadblocks she has run into with Worcester city government, as far as plots being available for land but not able to be used, zoning ordinances, etc. She has not had any issues with zoning. Before she met with the church, she found land she wanted from the city and the city said no way. The city said the land way too valuable and could be used for other purposes. Basically, the city had grand ideas and goals, but it's extremely slow and inevitably nothing happens with the land. The city's goal is to create jobs in the city, but the jobs they create are not suitable for the people that live in the areas where the jobs are being created. For example, creating a biotech factory in an area where many people do not have secondary education, or speak English. In order to serve a community, one must ask what the community wants. She said the city owns many properties, but so do a lot of corporations (privately owned land), and they just never answered her phone calls regarding the undeveloped land, most likely due to the fact that the land is contaminated.

She also stated that another issue is that all of the information that is available has not been compiled and made available to community development organizations and city policy makers. The area is over-studied even, but if the resources are not compiled, people cannot know what has been done. She described how different colleges should be working together, getting coordinated, to achieve a common goal to have one conversation with the city council and the mayor. She was adamant that if land is not making any money or gone to waste, it

should be given to urban agriculture stakeholders, instead of having to pay for it. Getting this message to the city in a serious way, that people are upset and want more land, is what people in her situation need.

We then asked her what resources might be available for our group to make use of during the development of our project. She said one of the most important aspects for our project would be collaboration. She said it would be interesting to talk with Joe O'Brien, and what he has done to push urban agriculture within the city council. He was the former mayor but did not run for a second term to spend time with his family. In this kind of project, it would be useful to have a friend with sway in city policy making.

Amanda first signed up as a community garden, as part of the UGROW program through the REC. She spent months looking for land that could be used, and when she first approached the REC about it, all they could offer her was small space in one of their community gardens, simply because they did not have much land available. They eventually found the land with the church, and started with ten raised beds that were about 3 feet wide by ten feet long, and twelve people. From that they expanded, to over 180 cubic yards of farmland, and much more volunteers. They also now have access to a flatbed truck that helps tremendously. She also mentioned how invaluable a resource the REC has been in her endeavors, and her farm is modeled after the YouthGROW model.

Lastly, we asked Amanda what kind of deliverable would be best for her organization from this project, or most valuable for other urban agricultural stakeholders. "Someone has to plant the seed with the city" is how she responded; referring to the idea that urban agriculture is very important, letting go of vacant city land, and making more resources available for urban agriculture stakeholders. We discussed our goal of getting everyone together to present our finding and our deliverables, and bouncing new ideas off of each other. She said this was a very good idea, and it would be helpful to get all these people together to form some kind of coordinated effort. Amanda explained that many of her colleagues at Clark are also very interested in researching urban agriculture in Worcester, and it would be helpful to talk with these people as well. She mentioned how some of these people have done work with GIS and

mapping the current urban agriculture condition in the city, overlaying demographics, poverty levels, etc. At this point, we concluded the interview.

B-2: Interview Summary for Ashley Carter of the Lutheran Social Services

Ashley Carter of the Lutheran Social Services was interviewed in person by Jay Rigenbach, Wenli Wang, and Matthew Valcourt on Wednesday, December 5th, 2012.

The interview began with asking Ashley about her position in her organization. She is the Worcester coordinator for New Lands Farms, a program within Lutheran Social Services for new Americans. Lutheran Social services is non-profit and non-denominational, that runs programs within the New England area. Ashley's program offers farming and gardening programs for new Americans. They deal with all types of people, and don't have to be specifically refugees, but anybody interested in learning to farm. To do this, they have an incubator farm, which is a training farm. They then employ the immigrants in Worcester's urban gardening program with the REC, essentially serving as a Liaison to connect farmers with land. They also have a connection with Worcester Common Ground CDC. The CDC purchases abandoned lots that are tax-titled from the city for very reasonable prices, and then places them under a tax exemption with the stipulation that they be used only for agriculture or educational purposes by Lutheran Social Services. This allows for a group like Lutheran Social Services to farm the land even though it is not zoned for agriculture, because it is being used for educational purposes.

At this point, we explained to Ashley the focus of our project is finding vacant land within the city of Worcester that could possibly be used for agricultural purposes. We then proceeded to go over the survey with Ashley. She specified that there are many issues that come with actually owning the land outright, and that using land under some type of agreement would be the best option for most farmers. She also talked about the idea of land being specifically allocated for agricultural purposes so that many different groups could access it and not actually have to pay a large sum to own it. According to Ashley many farmers would rather have permission to farm the land than actually own it themselves. Right now, LSS has a large-scale farm in Sutton, MA that immigrants use to farm their own smaller plots. Ashley also went into how it is hard to find a large piece of land within the city limits that could be used for agriculture, and how this creates a problem for anyone trying to farm within the city. Since land it is less available, many organizations are forced to look outside the city for suitable

agricultural land. She also cited that although cities like Boston have had cases of successful urban agriculture, they are dealing with many small pieces of land, which causes a headache, as opposed to dealing with one large chunk that could yield the same production as ten smaller plots scattered throughout a city. Ideally, her organization would be interested in a larger piece of land.

Ashley then spoke a little more about her organization. They use minivans to transport their food from Sutton to the farmer's markets in Worcester, and they also have a CSA in Sutton where people go to pick up the food they grow, which they are also looking to expand to include Worcester pick-ups. They do not have access to Worcester city compost, which they have fought for but unfortunately still do not have access too. At this point, they do not make their own compost. They have been operating for three years, with this last year yielding the largest amount of production thus far. They operate on a parcel that is 68 acres, however LSS only utilizes about 2 acres of that plot. They are however still growing and expect to be making use of about 4 acres by 2013.

The following is in regard to land and its characteristics. At this point, LSS is very understaffed, and recently they have not had the time to look for more land to farm on in the city, although they are open to it. As a matter of fact they want to obtain more land within the city. At this time however, they are searching in a passive manner and it is not on the top of their agenda. They have had no problem with soil quality outside the city, but Ashley did cite that farming within the city would definitely bring with it issues pertaining to the quality of the soil, specifically lead remediation. She also stated that in the city sunlight exposure is more relevant for a parcel of land because of the upright structures, and therefore it would need to be considered before farming on any piece of land. Certain herbs, lettuces, and spinach would do well with less sunlight exposure but these are only a handful of crops. Land slope is also an important feature, and effects what kind of agriculture can take place. Worcester is full of hills and therefore it's hard to find a piece of vacant land that is completely flat. Ashley then cited that although there are huge benefits to raised beds, she would prefer larger plots of land with the ability to grow in-ground.

When considering zoning Ashley again brought up the benefit of community gardens because they are like not-for-profit, and this is why their deal with Worcester Common Ground works so well. Specifically, it works well because these small plots of land are more like incubators used for educational purposes rather than one person owning the land and selling produce farmed on it in a commercial manner.

We then discussed land coverage with Ashley, and raised the topic of forested land. Although forested land has benefits, it would not be conducive for vegetable farming in her eyes and would need to be developed for that kind of farming to take place. Wetlands are such restricted pieces of land that they would not be worth trying to farm on, and should not be considered for development towards farming purposes. LSS is also open to aquaponics and farming vacant land within the city, if the right situation were to arise.

Next, we asked Ashley about the potential for urban agriculture in Worcester, and if she believes there is still room to grow. She believes it is only beginning and even has a foot up on some cities, but in order for urban agriculture to expand would require a lot of understanding from the community and city politicians. In Worcester, proponents of urban agriculture are getting more support but it is still not quite on the level it needs to be. The biggest challenge is getting enough different players involved, and utilizing the unused space that currently exists.

We discussed resources that might be available to our group that could aid in the completion of this type of project. Ashley spoke about New Entry sustainable farming out of Lowell, MA and how they have recently completed many ArcGIS land inventory maps of Boston, Metro Boston, and even part of Worcester County for the purposes of urban agriculture. She suggested getting in contact with Becca Weaver from this organization. She also cited land allocation organizations such as Land for Good; however the land in question is usually not in urban areas.

Lastly, we discussed with Ashley what type of deliverable would be beneficial for an organization like Lutheran Social Services from our group. She stated that GIS and maps are a great thing, but there is still a huge battle when it comes to actually obtaining the land that is identified and making it available for different organizations. She explained that case study

analysis would be useful in the city of Worcester, and could be used as precedence for changes to be made here. In this way, Worcester could emulate what other successful cities have done. She also suggested we speak with trustees from the Worcester Land Trust. Converting public spaces to land trust for agricultural purposes would be extremely helpful, and cited many organizations outside of Worcester that already farming on land in trust. Mainly, the most helpful thing would be bringing all these players together to create a successful system for Worcester. She also brought up that identifying parcels of vacant land, highlighting specific obstacles that are in the way of that piece of land becoming an agricultural property would be very helpful. That way people would know exactly what changes would need to be made before growing could take place.

B-3: Interview Summary for Becca Weaver of New Entry Sustainable Farms

Becca Weaver of New Entry Sustainable Farms was interviewed in person by Matthew Valcourt and Wenli Wang on Wednesday, March 20th, 2013.

The interview began with asking Becca to explain what her role was at New Entry Sustainable Farms and what her daily duties were. To this she replied that the program is new and an immigrant farmer-training plan. The core of the program is the business planning class and they also operate an incubator farm site. Farmers utilizing the incubator farm are only allowed to stay for three years so Becca works to find new sites for those nearing the three-year point. She utilizes GIS software in completing this task. Once she has found suitable land using the software the organization then meets with the township and the actual landowner to see if all parties would be open to utilizing the land for agricultural purposes. The majority of this work is done with private landowners and on occasion with institutional public land.

Next, we asked Becca to elaborate on New Entry's relationship with Tuft's. To this she replied that Tuft's is one of the organizations fiscal sponsors. They help to fund New Entry Sustainable Farms and allow them to remain as a non-profit organization.

Following this we explained the premise of our project at WPI and what the overall goal of our work was. We elaborated about how we are interested in finding vacant public land for agriculture in Worcester using GIS and visual classification. Furthermore we talked about the more technical aspect of completing this task and how we used the Worcester Parcel GIS Data overlaid with NAIP imagery to visually classify vacant public land in Worcester.

Becca asked us at this point about the soil layers in Worcester and how we planned to find that information. Matt then explained that we were using soil survey information from the same agency that published the NAIP imagery. Becca explained that what she normally encounters when looking at the soil layers in urban areas is the simple classification "urban fill." She also talked about how sometimes the data from sources like ours are not always up to date, especially in recently developed areas.

At this point in the interview, Becca spoke at length about the importance of composting on site when gardening and how this is especially applicable to Worcester. We then asked Becca why New Entry focuses on private land in their inventories. To this, she replied that it is not that they do not distinguish; they simply encounter more privately owned land. Following this reply we asked why the program has never looked into utilizing urban land and Becca explained that the farmers who are looking for land are looking for spaces of at least a quarter of an acre. To have a viable business she explained that you need to have a larger parcel of land and that a quarter acre is the point where people can just start to make money if it is run correctly. Continuing, she referenced urban farming efforts in Boston where people have attempted to patch together small plots of land that have been rezoned. Ultimately she said that urban farms require about one acre of space. Community gardens on the other hand can be much smaller. She said it would be very important to explain in our report how many parcels in certain size ranges that we find.

We then asked Becca for her opinion regarding the feasibility of completing a vacant land inventory in the city and whether or not it would be an effective tool. To this she replied, “Yes, some of these smaller plots in Boston have even given people jobs.” She did go on to speak about some of the pros and cons of farming in an urban environment such as the short distance to market or the cost of using city water.

We asked Becca whether or not she locates all of the vacant land through GIS or in other manners and she replied that they do not exclusively rely on GIS. What ends up happening is the mapping process is more of a way to get their feet wet. They may only find one or two parcels where the owner is interested in renting their land to a farmer, but what then happens is that people know about New Entry Sustainable Farms and refer landowners to them. Overall, the mapping process has turned out to be a good way to engage the community at large; especially whatever city agency they are working with (Agricultural commission or similar).

After this explanation we asked Becca what her criteria are for selecting parcels. She explained that she built the criteria based off of what she thought the farmers in the New Entry program would need to grow vegetables. The first quality she mentioned was that of soil quality

and she referred us to the Massachusetts GIS web site where anyone can download soil data. Also included in the Massachusetts GIS data is a table that actually shows projected crop yields in different areas based off of soil quality. Additionally she utilizes the 2005 land use survey, which classifies land based on the type of usage local government has allocated for it. She referenced that this data is older being from 2005. This method might only take a half hour for an entire town, but analyzing all of this information obviously takes much longer. To select pieces of land she creates a layer including croplands, Pastures, orchards, nurseries, open land, brush land, transitional, and very low-density residential land. She then cuts wetlands from this layer. She then adds an area field in the attributes table and calculates the area and selects for parcels that have at least two acres. She went on to say that there are still limitations to this method and the properties of interest still need to be ground- truthed.

We then asked Becca how new lands deals with water access and zoning regulations. She said that New Entry has not yet had to deal with zoning issues because most suburban communities that they are working in have residential zones that include agricultural uses. One issue with zoning that she has seen though is that once the produce is brought to market for profit the classification changes as opposed to a not-for-profit or personal use farm.

Lastly, we asked if there are any other features in GIS that she thinks we may be able to utilize. She said that we should look into the 2005 land survey that she uses in her work and see if there is anything we can pick out in general from that land use layer that would save us from having to look at the entire city. Specifically she said we should look at land use to help cut down our large parcel list. She also mentioned that New Entry would be interested in getting involved with Worcester if an organization like Lutheran Social Services wanted to move some of their farmers off site and into the city. Finally she said if we had specific GIS questions or we could try to contact a gentleman named Aaron Dushku who works for the Natural Resources Conservation Service out of the Middlesex office. He is that office's "GIS guy" and is involved in the supporting of local food production.

B-4: Interview Summary for Stacie Brimmidge of the Regional Environmental Council

Stacie Brimmidge of the Regional Environmental Council of Worcester (REC) was interviewed in person by Jay Rigenbach, Wenli Wang, and Matthew Valcourt on Monday, December 3rd 2012.

The interview began with us asking Stacie about her current role within the REC. She works directly with community gardens, oversees, and maintains them by supplying compost and seedlings. She also works with the city to get compost, create annual gardening workshops, and helps any farmer with the startup process for either a garden or farm in Worcester. We also asked about the REC's background. They have both food justice and environmental health and justice programs. Stacie works with the food justice program, which has many different projects within it including UGROW, Youth Grow and food markets among others. The overall mission is equitable access to healthy food, clean air, open space, and other similar advocacy work.

We were interested to hear Stacie's opinion on the current state of Worcester's Urban Agriculture program. She immediately identified a need for more space to grow food as the greatest obstacle in Worcester at that point. She went on to explain that gardens are not big enough to satisfy the needs of many farmers and she also noted that water access is a big issue in Worcester. Currently, the REC controls two "community farms", a half-acre on Oread St. which vends to their farmers market and grows 2000 pounds of produce a year. They also have a farm at Grant Square, which contains ten raised beds. They recently partnered with Lutheran Social Services to create an educational agricultural training center, which trains immigrants by letting them grown on a farm with allocated plots in Sutton, MA.

We then proceeded to go over our survey with Stacie. The REC does not currently own or rent any land. All the land they work on is a mix of private and public land. They have not explored foreclosed properties. They currently operate under MOU's (Memorandum of Understanding) for all the land they work on, basically a handshake agreement. The REC lost one of their farms because the leadership changed for the church that owned the land, so after they did all the hard work, they were asked to vacate the property. An ideal circumstance for

the REC would be having land in trust or protected land specifically for the use of Agriculture so it could never be taken. Some of their parcels are also owned by Worcester Common Ground, where WCG has an agreement with the city to buy the vacant lots so they outright own them, and then they allow groups like the REC to establish gardens on the parcels. They make sure the REC has water access, and handles the maintenance responsibilities for the property.

We then asked Stacie about important qualities and characteristics of any piece of land that could be used for agriculture. In terms of location, they try to find low-income areas to give those residents a chance to buy affordable, healthy foods. Considering soil quality, they mainly get compost from the city to grow in, and completely trust the compost, having recently tested it and identified it as extremely fertile. Sometimes they have problems with trash in the compost, which they combat by hand picking through it, but right now the compost is good quality and supports growth.

We also asked about types of land the REC is interested in, as far as developed, undeveloped, vegetated, or forested land. She believes Worcester has an excess of vacant lots available, and that is their main priority. They are also open to growing in abandoned lots, as long as the soil is remediated or a barrier is put down between the produce and leaded soil. Since all of their gardens are at capacity, they need to begin exploring for more land where they can grow. Zoning is also important, it would be much easier if land was zoned agricultural and it would allow them to be much more flexible. She stated that the city doesn't necessarily support them, but they don't bother them either. They have a good relationship with the department of public works and therefore zoning issues are ignored in some cases. When dealing with parks, you need to keep up certain aesthetics, which is yet another constraint.

We then proceeded to the second part of the interview, where we asked a series of questions pertaining to our particular project. We first inquired about any resources that might be available to us to help complete this type of project. Stacie identified the Worcester Regional Land Planning Association as group to look into. She also recommended talking to the Greater Worcester Land Trust about options for the city of Worcester. They maintain an abundance of open land in the city. We then asked about the REC's current interest in specific

properties around the city, as well as their interest in expanding. They are exploring the idea of a food hub that would connect to their farms. They have not really discussed future plans for any specific sites in Worcester. Lastly, we asked about final deliverables for our project that would be useful for a group like the REC. She identified a map or resource of available land in Worcester that includes the characteristics highlighted in the survey. She also stated the need for a map, as well as spreadsheets and a table and description of certain sites, which would help clearly identify important information pertaining to different pieces of land. She also mentioned the fact that many people have already mapped where current community gardens are located, but no one has actually done the work to map potential locations. An online host for this type of information would be very useful.

B-5: Interview Summary for Yvette Lavigne of the Worcester Common Ground Community Development Corporation

Yvette Lavigne was interviewed in person by Jay Ringenbach and Wenli Wang on Thursday, February 21st, 2013.

The interview began with us explaining the direction of our project and how IQP is a requirement for graduation at WPI. During this we explained that conducting interviews was a critical aspect of our project and we hoped to gain some perspective from a CDC director.

We then asked Yvette if she could explain a little bit about her position at Worcester Common Ground and what the main focus of the Worcester Common Ground CDC is. She replied by explaining that she is currently the interim director of WCG and that the primary mission of WCG is creating affordable housing. She was the development director but currently she is acting as a construction project manager. She then took it upon herself to explain that the real goal is home ownership, but in today's day and age they will settle for stable renting. WCG's target audience is made up of citizen's who fall between 30 and 60% of the median income of residents in Worcester. One of the major projects they completed in 2009 is located at 9 May St. and is comprised of forty-six units of affordable housing.

Furthermore, Yvette explained how section 8 housing assistance helps residents of housing units like those on 9 May St. pay a portion of their rent. The geographic target area of WCG is the Piedmont neighborhood. Currently their focus is on Austin St and overall, WCG serves a total of three census tracts.

At this point we asked Yvette if she could explain how WCG determines where their housing projects will be located and what type of environment the project is in. She went on to use 9 May St. as an example and explain that the building was formerly a dilapidated factory before they came in to restore the structure. Due to the sheer number of people who live in this building, Yvette believes that the area has improved. The corner store across the street ended up cleaning their storefront and somebody took it upon themselves to paint a mural on the side of the building.

We next explained to Yvette that we were interested in talking with people from the CDC's in Worcester because throughout our case studies of other cities with successful urban agriculture programs we found that quite often CDC's took a large role in promoting urban greening. We described how this was especially the case in Boston and asked Yvette if she considered this part of her mission. She replied by saying, "Yes, we within our neighborhood on Austin St. just created a tot lot" and described how it is a bit of a struggle to maintain at times. However she continued further to say that WCG is also involved with four community gardens. Two are located at Oread Place and she explained that everybody tends to take their own small plot. It turns out there is very little regulation and it works out quite well. WCG owns the property and pays the insurance as well as keeping up with maintenance such as snow removal during the winter. Lutheran Social Services and the REC also assist with the gardens at Oread Place. Yvette explained to us that 8 Preston St. is the next garden they had in the works and that it was located near some of their new first time home-owners. We were lucky enough to sit on a meeting concerning the land at 8 Preston St. during the next hour.

As the interview progressed the next major question we had for Yvette was if she believed urban greening was something that her constituents valued. "Absolutely" is how she replied. We went further to ask if she were to consider creating a green space near a housing project how would she go about implementing such a plan. Within their neighborhood there are many lots that are vacant and she said "why not" utilize them for green space?

At this point Yvette inquired whether we intended to actually create a garden or farm and we went on to explain that we hope to facilitate and promote the creation of new farms and gardens by people like those we have interviewed and their respective organizations.

The conversation strayed toward the REC's YouthGROW garden on Oread St. and we mentioned that they had issues with soil remediation, which is why the beds are all raised. Interestingly, Yvette mentioned that they had used an organization called "Soil Busters" to have their land tested. Apparently Soil Busters is an affordable service that can come to a piece of land and Worcester and tell you whether or not the soil is contaminated. Matt Feinstein is a contact Yvette offered up to us at Soil Busters.

Next we asked Yvette what types of resources are available that WCG could offer to someone looking to farm within the city. She said that WCG obviously couldn't create all of the necessary cash flow but that they would be open to purchasing a lot from the city "for \$500 or something like that." The property would hypothetically remain in the ownership of WCG and tack it on to their insurance while they worked at getting the city to hook up a water line. This was impressive to us because she was the first group representative who believed a project like this was attainable.

We then asked Yvette if she believed that WCG would be open to making urban agriculture part of their mission statement, especially in reference to creating green space during the process of building new housing units. She said that she certainly believed they would as long as her constituents were interested. She also believed the WCG board would be interested as well. In her own words Yvette said, "Yes, I'm totally into the whole garden thing." Obviously WCG is not opposed to this type of initiative because they are already doing it. She commented that it is easy right now because there are organizations like REC or LSS that help by going out and actually doing it.

We then asked if WCG receives pressure from the city to work on certain types of projects and she replied by saying that the city has always been supportive of every effort that the CDC has undertaken. Currently Yvette has a feeling that the city seems to think WCG's work is complete, which she said is strange to her because of the people walking in her doors who need housing. She elaborated that in order to create the city council's vision of the city, Worcester has to have strong surrounding areas, not just a strong downtown area.

Yvette next inquired about working further with the Center for Sustainable Foods at WPI. We went on to explain that new project groups will come into the center next year and that WCG would make an interesting sponsor for a project group. We offered her contact with our advisors, Prof. Hersh and Prof. LePage if she was still interested after more thought.

Our last real question for Yvette was if there are any obstacles she perceives standing in the way of increased urban agriculture. She mentioned that cash is always an obstacle but that obtaining lots from the city is usually relatively cheap. When we asked her if she had ever run into zoning issues and she said not really because the city has a certain trust when they are

selling a lot to a CDC. The city knows that the land will be appropriately used and maintained. Overall, she does not perceive zoning as an issue and she was generally surprised that most people thus far had cited zoning as a challenge that needs to be overcome.

B-6: Interview Summary for Colin Novick of the Greater Worcester Land Trust

Colin Novick of the Greater Worcester Land Trust was interviewed in person by Jay Rigenbach, Wenli Wang, and Matthew Valcourt on Wednesday, January 21st, 2013.

The interview began with asking Colin to tell us about himself and his position at GWLT. He replied by somewhat jokingly giving us the date that GWLT was founded (1987) and explained that around the time of the First World War people were moving away from Worcester although the population started to resurge in the 1980s. People at this point assumed that the unbuilt land in Worcester was owned by “the government” when in fact it was usually privately held. Since the land was private, people were able to develop open spaces that others previously used for recreation. This was the reason that the GWLT was founded. Upon its founding, the GWLT created an open land inventory in an attempt to help facilitate the development boom. Today the GWLT owns over 2000 acres of open space in Worcester and 7 surrounding towns.

Colin then explained that he is the executive director of GWLT and basically does everything that needs to get done. Colin is prevalent to this report because he has been working in his field for over fifteen years. His biggest piece of advice when communicating with government officials is to do so informally. “It’s all about informal relationships.” Whether it is going out to eat or getting coffee you will be more successful than writing an email.

At this point Colin spoke at length about the three categories of government land ownership. These categories or silos are the conservation commission, the parks department, and then there is the catch all. When the city council forgets to list or appropriate which department the land belongs to it often falls to the city manager or the economic development department just to name a few. This makes things difficult because when parcels end up in this category it can be very difficult to find out who to talk to.

The next question we posed for Colin regarded some of the road blocks for someone trying to acquire land in Worcester. To this he replied that there are many variables in this type of undertaking. Ultimately you need to know your destination and reverse engineer it or you need to know what the final thing is you are looking for. Otherwise you need to know exactly

what piece of land you want and figure out how to snatch it. At this point he referenced the open land inventory from 1986 and mentioned that it could be helpful in land acquisition endeavors. He also mentioned that the city plan which is in the works at this time should theoretically include a new inventory of open space. Unfortunately, when the city revisits this plan every five years they tend to just “dust off the ’86 survey.” The problem with this is that the 1986 survey was pre-digital and a lot of the information did not get transferred over, especially city owned land. This is due to the fact that if the land is owned by the city no one is paying taxes on it so the assessor’s office doesn’t have any interest. Colin recommended that anyone interested in recreating a complete database could select parcels with a certain number of blank data fields as these are the ones that the city neglects to update. For example if “owner” shows up blank, it may be a parcel to check out.

Colin took a new direction at this point and explained that parcels we would be interested in are probably shaped like a “C” around the outside of the city. This is because before motorized transportation people clustered in the center of the city so that could walk to work, walk to church, and walk to the store. The odd thing about the “C” shape around the outside of Worcester is that sprawl is a natural thing and happens in other cities throughout the rest of the country. In Worcester however the concern about overdevelopment during the 1980s helped to conserve the land that would have been built on next.

Our next line of questions revolved around whether or not Colin had ever worked with anybody looking to obtain land for agricultural use in the city. To this he replied “Sure.” He spoke about Joe Scully looking to find a small plot for his own use, and about how the REC periodically checks in to try and find a plot for a new community garden. Occasionally the GWLT has people call and ask for assistance in finding land for farming in Worcester as well. During an interesting tangent in the conversation Colin explained to us that there are two parcels remaining in the city that have livestock on them. These parcels were grandfathered in under a new set of zoning codes which stipulated that animals could not remain in Worcester overnight. That was essentially how the city got animals out of Worcester. These two properties are really old farms that have maintained their presence since the change in zoning laws.

We inquired as to how the work with the REC turned out and he explained to us that community gardens are born from a need in a neighborhood for a piece of land. In Worcester though, Colin explained that there is a lot of mobility. Although there might be a need in a neighborhood right now, ten or fifteen years down the road there is no guarantee that there is still a farmer working that land. This has been one of the disconnects that GWLT has with the REC because the REC serves the needs of people but when the GWLT touches land they “like to use the infinity sign’ so that the land remains conserved. Additionally the REC is not a land holding organization and the GWLT is. Unfortunately, the GWLT cannot put the infinity sign on a piece of property if they don’t know for sure that the land is going to be farmed forever. This is because the lots the REC is interested in are generally located in densely populated areas. So, ten years down the road when the people are not using the community garden anymore it turns into an unkempt dumping zone in a busy area, which is a problem, and the GWLT does not want to own a problem. Colin specifically referred to the REC’s largest garden and explained that it “almost makes sense to play together on that one.” It is large enough and enough people use it that it has become an anchor. Unfortunately, the area where it is located is surrounded by old brick factory buildings and the GWLT does not know for sure whether that area will be industrial, residential, or commercial in the next decade. If the GWLT were to buy a piece of forested land and swamp land they can be reasonably sure that that land is not going to change. In the built human world though, things change too fast to predict.

Colin’s “secret” plan for helping agriculture is making use of chapter 6I in the Massachusetts State tax code. Chapter 6I stipulates that if you can promise not to develop a piece of land for ten years and utilize it only for agriculture, you only pay ten to twenty percent of the normal taxes. However, if you decide you want to develop the property after six years or so, you owe all of the back taxes. Additionally, if someone came and offered to buy the land for ten million dollars, the city has the right of first refusal and can match the ten million dollar offer to buy the land if they so desire. Unfortunately, there is a minimum size restriction of five acres for chapter 6I. In the city, five acres is hard to come by. Colin would like to implement a smaller scale of chapter 6I for use in the city where parcels are smaller.

Colin then spoke to the difficulty of implementing agriculture in Worcester because of the steep slopes and generally poor soil quality. Fortunately he said, there is a soil map that can

be imported into GIS and you could then select for places that are relatively flat and have decent soil quality. Colin talked about the possibility of using silviculture, or forestry, as means of phytoremediation in contaminated soils. Colin also talked about how planting crops or trees would be relatively simple, but people are very sensitive about livestock. If someone were to receive permission to run a pilot program on a piece of land then having chickens or other livestock might be viable.

The only time zoning codes are actually enforced in the city are when neighbors are unhappy because the “Jones’ grass is too long.” Someone from the city then receives the neighbor’s complaint, digs through the zoning codes, and finds a way of enforcing whatever the code might be. If agriculture were kept neatly the neighbors would have no reason to complain and zoning would be a non-issue. Colin believes this is a feasible way of operating because when asked if he believed there was support for agriculture in Worcester he answered “Yes, of course.” Again though, he said the problem would be when people started trying to house animals.

At this point we asked Colin why it was that Worcester doesn’t have any agricultural zoning provisions. He essentially said that this happened because people associated agriculture with uncleanliness that did not mesh well with the people’s idea of what type of city Worcester was going to be. He explained that Massachusetts zoning is some of the worst and most complicated in the country. People in Massachusetts seem to think that zoning reform is some unattainable holy grail. To some extent they are right because zoning reform would need to happen across the entire state and this would take a huge effort. Luckily though, people have managed to come up with organic solutions on the fly where they sight one stipulation or another as a means of accomplishing whatever goal they have in mind that seems to be prohibited by zoning. It is a slow and clumsy system, but it does seem to work.

As far as agriculture is concerned, we asked Colin to elaborate on some of the competing interests and how they might act as barriers to increasing urban agriculture. He simply said that money is the biggest barrier and agricultural endeavors have a difficult time coming up with capital for acquisitions. Luckily for the GWLT, they are partnered with the government, and although sometimes reluctantly, the government brings some money to the

table and GWLT brings some money to the table, and they are able to pool it together and acquire new land in that manner. GWLT gains there funding from a hybrid of public and private funding. Another barrier that Colin addressed was the three silos in which public land is held. Agriculture is not in the mission statement of the conservation commission, the parks department, or any of the other smaller owners. Consequently, it is very difficult to convince someone to do something with their land that is not a part of their mission statement. “Good luck” he said. The best bet would be to wait until a new department head comes along and convince them that agriculture is not the end of the world and to incorporate it into the new mission statement. To do this though, you may have to wait a very long time until the changing of the guard.

We then asked how organizations like the REC got past zoning regulations and other barriers. To this Colin responded that the people who owned the plot that the REC now uses were sitting on it for a couple of years, couldn’t find any uses and were unable to sell it. Additionally the REC was involved in the community and was able to develop relations with people in the neighborhood. These relations allowed them to move forward in implementing the garden. The biggest trick that the REC is using is that they are using money to improve a property owned by somebody else, which means the property owner is essentially making money. What started out as a wasteland is now an improved lot that is much cleaner and has a positive vibe. This is tricky for the REC because they just used funds to improve a property with no guarantee that they can stay there. This is the trade off with this strategy.

At this point we explained to Colin that all of our interviewees thus far were concerned about land tenure when trying to farm a piece of property. Colin responded to this saying that is why he is interested in some type of a modified chapter 61 for use in the city. You could stipulate ten years or twenty-five years that the land must remain undeveloped and provide opportunity for renewal at the end of that period. This would provide a long enough window where growers would feel comfortable investing in improving a property. One of the reasons that GWLT is so “sticky” with land is that if Colin is going to ask a private organization for \$20,000 for a piece of land that may not be there in ten years, it is a really hard sell. Colin is forced to prove that the land is still going to be there and the investment will not be wasted. There is another tool known as a deed restriction between a property owner and a farmer

where the farmer is allowed to use the property for “X” years and after “X” years the two sit down at a table and decide whether or not to keep going. The maximum number of years on this type of agreement is thirty but you could choose any number of years in between. Unlike chapter 6I where there is an opportunity to pay your way out of the agreement, in a deed restriction you are locked in. In order to use the infinity symbol, GWLT uses a conservation restriction and needs to get the city and the state to sign off along with a lot of other hurdles to make this happen. There are a lot less hurdles in a deed restriction; two people sit down with lawyers and it is done. The GWLT does not work with deed restrictions though; they work strictly with conservation restrictions.

The GWLT does not work with parks either because parks are used for active recreation and have paths, playing fields, pools, and other developments. GWLT is closer to being a forestry service that manages the natural condition. Colin explained that they are concerned with preserving wildlife habitat and providing for passive recreation, or recreation that does not leave a permanent footprint.

One of our last questions for Colin was if the GWLT would ever be open to incorporating agriculture into their agenda. Colin said yes, and explained that they have worked with agricultural organizations in the past and talked about agricultural preservation restrictions. This is essentially a flavor of a conservation restriction that has the infinity symbol attached. As a matter of fact, the GWLT has a piece of land under agricultural preservation restrictions in Spencer, MA. Unfortunately this is difficult because there are no large tracts of farm land in Worcester that could be preserved right now. If someone was to identify a piece of land and flag it as prime agricultural land then maybe the GWLT could set out on the path of putting this parcel into an agricultural preservation restriction knowing the whole time that they would begin farming it after the preservation was accomplished. An APR has a minimum acreage requirement and soil quality requirements. The GWLT on their own looks for pieces like this and says “look, continuous land, lets preserve it.” At that point they put it into preservation, but not necessarily agricultural preservation.

Overall, preservation restrictions run contrary to western law, which recognizes that everything is always changing, and placing the infinity symbol on a piece of land really freaks

people out. This is why it is so difficult to get the state to sign off on restrictions. At this point, Colin had to leave and we concluded the interview.

APPENDIX C: CASE STUDIES

C-1: Case Study for the city of Boston, Massachusetts

Why?

The city of Boston has a long history of urban growing dating back to WWI. After the war the community gardens lagged until the Second World War, during which time the number of gardens skyrocketed and they became known as victory gardens. Again, following the war the number of gardens lagged until the late 1960s when neighborhood activism became prevalent and agriculture came back to the forefront of people's minds as a quality of life issue. The latest and most sustained push for urban agriculture began in the late eighties and continues on today.

How?

The document that was utilized is a study concerning what infrastructure for agriculture already existed in Boston and how it has been developed over the years. Additionally the interviews in the first study, although dated, give the reader good insight as to what some of the driving factors in the push for agriculture have been. Some prevalent motivations will be discussed below

RVH: This organization works with young single mothers. They shelter the mothers for about a year during which time they learn various skills. Agriculture is among them but business skills are included as well since RVH sells its produce to local restaurants. They have been a successful organization, which in the late 90's received an annual grant of \$150,000.

DSNI: Centered in the depressed neighborhoods of Roxbury, DSNI aims to make locally produced food available to residents who live in the neighborhoods where it was produced. They have worked hard to strike a balance between housing development and urban greening in order to make the city a better place to live. DSNI has been around since the early 1980s and continues to be a large piece of the framework that makes up the city's agriculture infrastructure.

Who?

The following boards, city agencies, commissions, and divisions worked together to address local food production:

- Mayor's office
- City Council
- Committee for the Cultivation of Vacant Lots
- Fenway Garden Society
- Boston Urban Growers (BUG, disbanded in 2000)
- Garden Futures (a large conglomerate)
- RE-Vision House
- Mass Audobon Society
- Greater Boston Urban Resources Partnership
- The Boston Foundation
- The Boston Globe Foundation
- Urban Agriculture Alliance
- Dudley street neighborhood initiative (DSNI)

Key Issues:

1. Development competition (gentrification)
2. Public support for market farms was hard to come by despite the abundant community gardens. (i.e. public did not want commercial farms.)
3. Boston CDC's are focused on housing development, as a result of public pressure from city government to address high demand for land.
4. Diminutive access to affordable and healthy food, particularly for underserved communities

Basic Ideology:

1. Become a model incubator for urban grassroots activism.
2. Create stronger community organizations and a level of neighborhood interaction with city government unlike in other cities.

3. Emphasize the recreational and social benefits for community gardening rather than just the entrepreneurial benefits.
4. Identify key policy concerns related to local food security and to the food system that supports it.
5. Promote economic opportunity and greater self-sufficiency for people in need, including increasing the capacity of Boston residents and business and grow and distribute local and healthy food.
6. Promote economic opportunity and greater self-sufficiency for people in need, including increasing the capacity of Boston residents and business and grow and distribute local and healthy food.

Solutions:

1. RVH; use agriculture as a means to improve the lives of young single mothers. i.e. piggy back with other important social issues
2. Create community supported market farms which provide food to residents
3. DSNI; instill the importance to young people of making locally grown produce available to others in the neighborhoods where it was grown
4. Create a balance of new housing units and green space in developing neighborhoods.
5. Set aside vacant land and parkland for urban food production.
 - a. **City Growers:** Works with community partners to secure land in the city for growing food. Strives to convert abandoned city lots into thriving green farms. Currently operate on an acre spread over Roxbury and Dorchester.
6. Large number of agencies and non-profits committed to community greening and urban food security (i.e. large and diverse coalitions can be formed to advocate collectively.
7. Established neighborhood organization committed to entrepreneurial urban agriculture as part of its strategic development plan.
8. The Pilot Urban Agriculture Rezoning Project was initiated in the fall of 2010. A collaborative effort between the Mayor's Office, the Department of Neighborhood Development (DND), and the BRA, the Pilot Urban Agriculture Rezoning Project involved the creation of an Urban Agriculture Overlay District on two city-owned

properties in South Dorchester and the issuance of a Request for Proposal (RFP) to identify prospective farmers.

C-2: Case Study for the city of Portland, Oregon

Why?

Portland wanted to develop citywide strategic and comprehensive land use planning, environmental research, urban design policy and services to advance energy efficiency, green building, waste reduction, composting and recycling, solar and renewable energy use, and local sustainable food production; as well as actions to mitigate and adapt to climate change. Recently, Portlanders have shown a huge interest in urban agriculture. Urban Agriculture is concurrent with and supports the Governing Principles adopted by the City of Portland to promote, support and strengthen a healthy regional food system. The Portland Multnomah Food Policy Council recommends a goal of fostering community livability, youth education, economic resiliency and creation of urban spaces by increasing the presence of, and improving access to, a broad range of urban agriculture opportunities on suitable land within the City of Portland.

Who?

The following boards, city agencies, commissions, and divisions worked together to address local food production:

- Portland Multnomah Food Policy Council
- Technical Advisory Committee
- Brendan Finn
- Dan Saltzman
- City Council
- East Side Community Garden
- Verde Native Plant Nursery
- Zenger Farm
- Portland Parks and Recreation
- Portland Park and Recreation
- Bureau of Environmental Services
- Portland Office of Transportation

- Portland Water Bureau

How?

In 2004, Diggable City Phase I was just initiated, a land inventory intended to highlight opportunities to use vacant, city-owned land as community gardens or urban farms. Phase II and III of this project not only focused on the potential for community gardens, but for other urban agricultural purposes as well. As they built up the land inventory, other ways to promote urban agriculture such as changing food zoning code, exploring school garden programs, expanding farmer's market and so on were fostered as a result. The Sustainable Food Program was also developed and holds several projects that contribute to urban agriculture in Portland.

Key Issues:

1. Suitable land should be identified for urban agriculture.
2. Policies and zonings prohibited to urban agriculture need to be changed.
3. Infrastructure required by urban agriculture.
4. Shortage in funding for Urban Agriculture Activities
5. Challenges to developing projects on identified sites include the often long process of finalizing a lease with whichever city bureau owns the land
6. Absence of city or other funds to support improvements like fencing and installing water meters.

Basic Ideology:

1. Urban gardening supports self-sufficiency and access to healthy food for Portland residents;
2. Community gardens are important neighborhood gathering places that contribute to the city's parks and open space system and support neighborhood livability;
3. The Community Gardens Program encourages organic gardening, building healthy soil, new and heirloom plant varieties, composting, cover cropping, food sustainability, [and] intergenerational activities.

Solutions:

Key Issue 1:

Create a land inventory by first conducting Diggable City Phase I, which assumed all lands were available for urban growing. A Technical Advisory Committee was established to help develop criteria, classify land, and other technical support such as GIS use. Phase II and III were implemented in order to narrow down the inventory and to have discussions with different bureaus regarding the potential for allocating the land that was found for agricultural uses in the future . While the land inventory was conducted, issues of policy/zoning for agricultural purposes (not limited to land use) and the lack of infrastructure was noted and discussed.

Key Issue 2:

Land use policies and zoning were analyzed deeply by the Urban Agriculture Land Inventory Subcommittee to make recommendations for code changes. Examples were adding definition for urban agricultural uses to zoning code, allowing small-scale retail, allowing exterior work activity, and adding eco-roof programs to urban agriculture. The Portland Urban Food Zoning Code Update was a project to revise the zoning code regulations to support market gardens, community gardens, farmers markets, food buying clubs and community supported agriculture (CSA) organizations. Its goal is to increase access to healthful, affordable food options for all residents, especially those who currently have limited access.

Key Issue 3:

Take water as an example. Access to water would be a huge cost for urban growers in Portland. While some people were trying to communicate with the Bureau of Water to reduce the water rate, others tried to figure this out by managing and using storm water. Lack of infrastructure can be figured out by changing the code or finding alternative methods to improve water access uniformly throughout the city.

Key Issue 4:

The Diggable City project team stated that “a primary barrier to growing the program is funding at sufficient levels”. Discovering creative funding strategies is essential in any urban

agricultural activity. Renting, foundation and grant support, partnership, nonprofit model and some other resources are good ways to solve the problem.

Further Solutions:

1. **Urban Farm Collective:** Brings neighbors together to transform vacant lots into neighborhood food gardens for the purposes of education, research, community building and improving food security.
2. Links on the City of Portland Website are provided to potential farmers for the purposes of investigating historic permits for potential sites, as well as recommendations of places to begin growing, and feasible methods for soil testing.
3. Portland Food Policy Council worked with one planner in the city's Bureau of Planning and one from the city's Bureau of Development Services to analyze how to remove land use policy and zoning barriers to urban agriculture.

C-3: Case Study for the city of Providence, Rhode Island

Why?

Providence is entirely aware of global warming and the reduced impact they could have on climate change by eating locally grown food. Furthermore they realize that food flown in from around the world results in the use of more fossil fuels that could be eliminated if the food were grown in Providence. Finally, Providence policy makers are aware of the long term needs of the community and the need for increased food security within the city.

How?

There have been studies concerning what needed to be done in order to increase urban agriculture in Providence. Funding for these studies came from the USDA Community Food Project Grant. Using this funding local activists and stakeholders were able to come together to complete the necessary research. A city plan for the future in 1992 stated in a few brief lines that a plan for urban agriculture was to be created. As a result, the city council took a nonchalant attitude and created a plan of a similar nature. Later, the city's Department of Planning and Development spearheaded and created a comprehensive plan which called for the creation of the Urban Agriculture Policy Task Force. Reports such as the studies referred to above were created for use by the Urban Agriculture Policy Task Force.

Who?

The following boards, city agencies, commissions, and divisions worked together to address local food production:

- Mayor's office
- City Council
- Department of planning and Development
- Urban Agriculture Policy Task Force (founded 2004)
- Youth Gardening Program
- Elmwood Foundation
- Southside Community Land Trust

Key Issues:

1. Zoning laws did not address agriculture.
2. The illegality of overnight parking resulted in the paving of prime backyard growing spaces.
3. Special use permit required for community gardens.
4. Few providence families grew their own food.

Basic Ideology:

1. The need for an engaged public in performing surveys that gauged what levels of urban growing existed.
2. Promote practices and policies that support Providence's local food system.
3. Create a universal "language" for urban agriculture citywide.
4. Encourage economic growth, strengthen communities, create a healthy, beautiful city, and strong and financially stable families through the means of urban agriculture.

Solutions:

1. Recognize urban agriculture as a strategic asset for community development, neighborhood beautification, and public safety.
2. Adequately fund non-profit urban agriculture initiatives.
3. Fund a state-wide Farm to School coordinator, and integrate agriculture and gardening across school curriculum.
4. Revise zoning restrictions that prohibit agriculture.
5. Influence the Comprehensive Plan Update.
6. Repeal the overnight on-street parking ban.
7. Provided recommendations to adjust plans by suggesting comprehensive plan language that would address for urban agricultural issues.
8. Create new community gardens on public city property. Also, convert un-used or vacant land owned by city and community agencies into community food gardens.
9. Remove special use permit requirements for community gardens.
10. Provide grants to help families create food gardens at home.

- I 1. Provide local growers with low-interest loans and other micro-enterprise supports for start-up and land acquisition.
- I 2. Mayor Angel Taveras announced a partnership with Southside Community Land Trust and the Rhode Island Foundation Jan. 14, 2013 in a project aimed at renovating the vacant lots that sprinkle the city's undeveloped land parcels and turning them into small farming plots.
 - a. **Lots of Hope:** An environmental initiative to transform vacant city-owned lots in Providence into urban farms was awarded a combined \$100,000 by The Rhode Island Foundation and Florida-based Local Sustainability Matching Fund. Lots of Hope program will enable Providence residents to access low-cost, underutilized public land, as well as technical assistance and hands-on support from Southside Community Land Trust.

C-4: Case Study for the city of Toronto, Ontario

Why?

Promoting local food production is an important component of the Climate Change, Clean Air and Sustainability Energy Action Plan, which was adopted by Toronto City Council in 2007. When food is grown and consumed locally, as opposed to food imports that are transported greater distances from the field to the point of purchase, there is a reduction in greenhouse gas emissions. Public interest in local food and urban agriculture was increasing rapidly. Demand from City park users to allocate additional city lands, particularly parkland, for the purpose of gardening and food production.

How?

Money made available for urban food production projects from the Toronto Environment Office budget were established as a one-time fund as part of the Live Green Toronto initiative approved by City Council in December 2007. Funding was approved in the 2008 Toronto Environment Office Capital carry forward and 2009 Operating Budgets for the combined amount of \$500,000. Parks and Environment Committee hosted panel of experts in the field of urban agriculture to discuss the ongoing initiatives and issues in this emerging field. Experts helped Committee identify how the City of Toronto could best support the urban food production movement and constraints. In September 2008, Toronto Environment Office established an interdivisional working group with a mandate to explore and address barriers to increasing local food production in city.

Who?

The following boards, city agencies, commissions, and divisions worked together to address local food production:

- City Planning
- Economic Development, Culture, and Tourism
- Parks and Recreation
- Social Development, Finance, and Administration

- Toronto Housing Corporation
- Toronto Environment Office
- Toronto Public Health
- Toronto Food Policy Council
- Toronto and Region Conservation Authority
- Transportation Services (Clean and Beauty)

Key Issues:

1. Utilization of Public Lands for Food Production
2. Ability to sell produce grown on Urban land at farmer's markets
3. Expanding opportunity for urban food production on private lands (land use, zoning, taxation, other landowner costs)
4. Mid-scale composting

Basic Ideology:

1. The need for a coordinated effort in developing a policy and regulatory framework that would facilitate urban agricultural activities;
2. The need for due regard to human health and safety and;
3. The need for additional support for urban growers.

Solutions:

Utilization of Public Lands for food production:

- Expert panel requested that the City investigate ways of increasing land for urban food production
- Parks, Forestry and Recreation expanded its existing community and allotment garden spaces in 2009
- Developed a policy framework to increase opportunities for urban agriculture in City parks and other open space areas, built upon current practices/ implementation criteria.
- Toronto Environment Office looked at feasibility of using other publicly owned spaces that are suitable for urban food production (i.e. surplus city property, school boards, hydro lands and institutional lands in other jurisdictions)

Ability to sell food grown on urban land at farmer's markets:

- Proposals for commercial farming of fruit and vegetables within city, therefore a commercial urban farmer could be considered a farmer for farmer's market purposes.
- Definition of farmer expanded to include urban farmers.

Expanding Opportunities for Urban Food Production on Private Lands - Land Use, Zoning, Taxation and Other Landowner Costs

- The City has the legislative ability to make grants to not-for-profit community groups for such purposes, and the grant amounts could be set equivalent to the costs imposed by a landowner on the community group for the portion of land used for these purposes, or on any other basis that Council deems appropriate.
- Toronto Environment Office, with the Chief Financial Officer, explored potential opportunities for providing financial assistance by way of grants or partnerships to organizations interested in "pursuing large-scale urban food production projects". Grants managed and administered through Toronto Environment Office.

Mid-Scale Composting:

- In addition to producing own compost, urban farm operators purchase the quality and quantity of compost they need in bulk from local compost suppliers. Advantageous for urban agricultural businesses to purchase compost collectively perhaps negotiate a reduction in the unit price.
- City facilitates development of guidelines that would help in establishment of mid-scale composting operations that would process organic materials collected from off-site sources on urban agriculture sites.

Protecting Community Health: Soil Quality

- To ensure that the soil on these sites is suitable for growing food, Toronto Public Health's Environmental Protection Office, in consultation with Parks, Forestry and Recreation, has initiated the development of a protocol to assess the potential risk from exposure to urban soil contaminants and the suitability of sites in City parks and other lands as they are considered for urban agriculture projects

Support and Implementation

- Toronto home to a well-developed non-governmental organization community that is active in field of urban food production.
- Community Food Animators and Food Security Investment Program (FSIP): supports small number of neighborhood food projects and city-wide food animators program. Annual budget of \$300,000.00.
- Toronto Community Housing encourages and provides resources for their residents to request community garden space on their property.

C-5: Case Study for the city of Vancouver, British Columbia

Why?

Urban agriculture is an essential strategy for planners to address many of the city's emerging challenges with creative, multi-faceted solutions. Urban agriculture defined in simple terms is "the growing, processing and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities. The final goals are to support food-friendly neighborhoods, empower residents to take action, improve access to healthy, affordable, culturally diverse food for all residents, make food a centerpiece of Vancouver's green economy, and advocate for a just and sustainable food system.

How?

On 8 July, 2003, Vancouver City Council approved a motion supporting the development of a just and sustainable food system, in which food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of the city. In that year, a Food Action Plan was drafted and a Food Policy Task Force in Vancouver investigated the potential for urban agriculture in the city. By creating a land inventory, analyzing policies and zoning, and also attracting more attention from City Council, Vancouver was able to adopt a wide range of programs and services related to urban agriculture that are still currently underway.

Who?

The following boards, city agencies, commissions, and divisions worked together to address local food production:

- Vancouver City Council
- Vancouver Food Policy Council
- Vancouver Parks and Recreation
- Vancouver Food Policy Staff Team

Key Issues:

1. Funding is an issue for most of the cities which want to develop urban agriculture.
2. Land tenure: Generally land tenure is granted for only 5 years in Vancouver.
3. Lack of political will is another barrier to implementing urban agriculture.
4. Vancouver is almost completely built out. Market value of land is high and housing demand continues to grow.

Basic Ideology:

1. Improve social, environmental, and economic sustainability; community development; and environmental health.
2. A Food Charter for the City of Vancouver.
3. Strategies to increase access to groceries for residents of Vancouver.
4. A coordinated effort to reduce food waste and redirect food destined for landfill.
5. Review of the potential of an Institutional purchasing policy for public facilities.
6. Who pays for start-up and operational costs of urban agriculture sites?

Solutions:

1. Established a Vancouver Food Policy Council to facilitate a number of food-related initiatives
2. Food Strategy was published as a draft for City Council consideration.
3. Vancouver reviewed zoning and policy to allow more areas for growing, as well as other kinds of urban agriculture and identified urban agriculture as a priority in some neighborhoods.
4. Website was established to encourage people to grow and eat local food. This is a great way to promote people's attention on urban agriculture.
5. Vancouver encourages street food vending. Not only solves food problems, but also brings economic benefits.
6. Conducted a food assessment for the city to:
 - a) Identify neighborhoods and populations vulnerable to food insecurity;
 - b) Analyze the food retail sector for nutritional quality and affordability;
 - c) Recommend social enterprise activities that would serve to strengthen access to

nutritious food.

7. Vancouver initiated a land inventory modeled after Portland's Diggable City, to address the evolving food policy mandate that identified urban agriculture as a priority.
 - a) Purpose was to support land use decision making, to serve as a public resource to build awareness, to support the city's existing sustainability commitments, and to contribute to a citywide UA strategy.
 - b) May 30, 2006 Councilor Peter Ladner called for the city to work with the Vancouver Food Policy Council to create 2010 new garden plots in the city between January, 2006 and January, 2010.
8. **Develop institutional support:** Establish mechanisms to facilitate cooperation and partnerships between relevant city departments, food banks, and other community services; fund and staff a formal municipal community garden program to manage UA initiatives throughout the city

APPENDIX D: SITE PROFILES

14 Guilford St. (North Worcester)

This site is zoned for single-two family residential, which excludes agriculture. The parcel itself is actually a wetland area that is surrounded on all sides by residential housing. It is heavily overgrown with vines and small trees and is by no means suitable for agriculture. The existing soil is covered in refuse and is undoubtedly contaminated, although the site does have excellent sunlight exposure. We do not recommend this site for further investigation.



OWNER	CITY OF WORCESTER TAX TITLE CUSTODIAN
AREA (ACRES)	0.21
ZONE	RL-7
VACANT	YES
GROUND COVER	VEGETATED
POTENTIAL USE	WETLANDS



20 Vincent Ave. (Columbus Park)

This parcel is a small vacant island in the middle of a neighborhood that is zoned for single family residential use and is covered by grass and scattered decorative trees. The parcel is flat and raised approximately four feet above street level. One concerned citizen actually came out to meet us and informed us that the area was used quite often. The parcel is sunny and well-kept and water access should not be an issue due to the residential area. This would be a good candidate for a community garden if neighborhood support could be gained. This parcel is a part of Columbus Park and is maintained by the residents in the neighborhood.



OWNER	CITY OF WORCESTER PARK DEPARTMENT
AREA (ACRES)	0.33
ZONE	RS-7
VACANT	YES
GROUND COVER	GRASS
POTENTIAL USE	COMMUNITY GARDEN



33 Merrick St. (Piedmont Neighborhood)

This is a small plot zoned for general residential use, half of which appears to be partially utilized as a garden. There is an existing fence around the border that requires repair. Sunlight exposure is fair at best due to the fact that the parcel is surrounded on three sides by three story homes. There is a slight slope away from Merrick St. and the agriculture that is occurring is in the ground and not raised beds. This means that soil remediation has already begun. Water access should be simple due to the residential location, but overall the parcel is in a state of disrepair despite the current agricultural activity taking place.



OWNER	CITY OF WORCESTER EOEND
AREA (ACRES)	0.16
ZONE	RG-5
VACANT	YES
GROUND COVER	VEGETATED
POTENTIAL USE	COMMUNITY GARDEN



42 Chatham St. (St. Paul's Cathedral)

This parcel appears easily accessible as it is abutted by a parking lot and roads with ample on street parking. On the site itself, there are landscaping improvements such as flowers, shrubbery, and a small granite bench that serves as a memorial. The site has a slight slope and already features a water spigot, and excellent sunlight exposure. The soil on this property should be tested before use, due to its central location and high traffic volume. The actual location is at the Intersection of Chestnut St. and Chatham St. The parcel is zoned B.G. G-1 or General Business Use G-1. This site could potentially serve as a community garden.



OWNER	CITY OF WORCESTER SCHOOL DEPT
AREA (ACRES)	0.05
ZONE	BG-6.0
VACANT	YES
GROUND COVER	GRASS
POTENTIAL USE	COMMUNITY GARDEN



72 Coes St. (Coes Pond)

This is a sizeable grassy area zoned for limited manufacturing use at the intersection of Coes and Mill St. On one side is Coes Reservoir and on the other side is the wetland Coes Pond. The parcel also contains a small newly developed parking lot, and a walking path around the perimeter of the property adjacent to the reservoir. The proximity to reservoir waters may limit the use of nitrogen-based fertilizer. Sunlight exposure is excellent, although soil remediation may be required due to the recent construction. The parcel is relatively flat and on street parking is available. Ground truthing revealed that this parcel is actually covered in grass and not vegetated.



OWNER	CITY OF WORCESTER CITY MANAGER
AREA (ACRES)	2.6
ZONE	ML-1.0
VACANT	YES
GROUND COVER	GRASS
POTENTIAL USE	MARKET GARDEN



280 Clark St. (Clark Street Elementary School)

This site is located at Clark Elementary School and is zoned for general business use. The majority of the school grounds are grass and playing fields, however, the North West corner of the property appears to be a promising candidate for the establishment of a school garden. The parcel has excellent sunlight exposure, no slope, and ample parking space, along with potential access to water through the school. Directly across the street from this property is a DPW yard waste disposal site. This means that access to compost will most likely be very simple.

OWNER	CITY OF WORCESTER SCHOOL DEPT
AREA (ACRES)	16
ZONE	BG-2.0
VACANT	PARTIALLY
GROUND COVER	GRASS
POTENTIAL USE	SCHOOL GRADEN



285 Tacoma St. (Tacoma Street Play Ground)

This parcel is a large park area that is zoned for single-two family residential use, which excludes agriculture. The left side of the parcel from the street view appears to be well maintained but unused. Overall, the land has good sunlight exposure, a moderate slope in some areas towards the forested area. Water access may be difficult due to its location on the property. This site is also near a DPW yard waste disposal area, which would mean that access to compost should be simple. This property could serve as a highly visible community garden due to its location in the park.



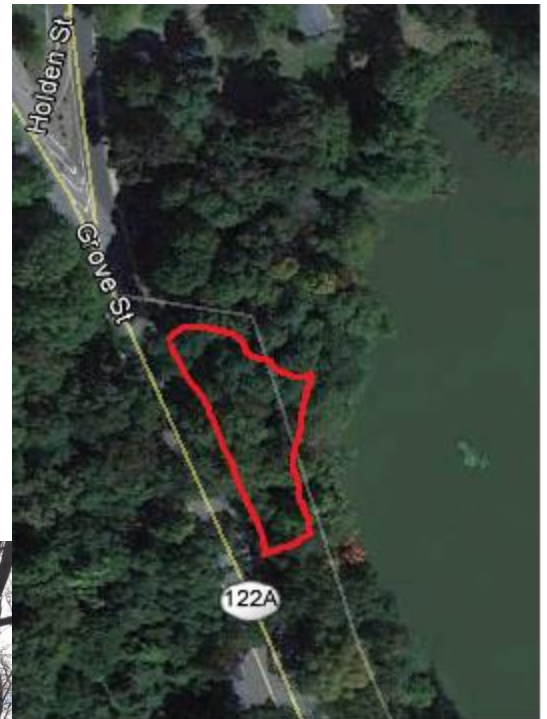
OWNER	CITY OF WORCESTER PARKS DEPT
AREA (ACRES)	6.96
ZONE	RL-7
VACANT	YES
GROUND COVER	FOREST/GRASS
POTENTIAL USE	COMMUNITY GARDEN



578 Grove St. (Morgan Park)

This site is zoned for single family residential, which excludes agricultural uses. The site itself is a small area with a low density of hardwood trees over grass. There is a stream on the North end of the property and Indian Lake forms the Eastern border. The slope near the water is extremely steep but the remainder of the parcel is flat. Sunlight exposure could pose a serious issue for agriculture, as the canopy created by the trees during the summer would cast the area in shade throughout the day. Soil quality may also be poor due to the heavy volume of traffic in the area and the ground is actually hard and compacted due to the high amount of foot traffic it receives. The parcel is located at the intersection of Grove St. and Holden St. Trees would need to be cleared before agricultural use and there is no off street parking.

OWNER	CITY OF WORCESTER DPW
AREA (ACRES)	0.25
ZONE	RS-10
VACANT	YES
GROUND COVER	FOREST/GRASS
POTENTIAL USE	COMMUNITY GARDEN



1006 Grafton St. (Roosevelt School)

This parcel is zoned for use as a single-two family residential space and is a large grassy field which is owned by the Roosevelt School of Worcester. There is a children's jungle gym off center of the field. The parcel is actually located adjacent to Sunderland Rd. The property has a steep slope near the road but is otherwise flat. Soil quality is most likely excellent due to the relative seclusion.

There is no off street parking available other than the school's lots. The parcel has excellent sunlight exposure and possible access to water through the school. This site holds potential for use as a school garden.



OWNER	CITY OF WORCESTER SCHOOL DEPARTMENT
AREA (ACRES)	9.33
ZONE	RL-7
VACANT	PARTIALLY
GROUND COVER	GRASS
POTENTIAL USE	SCHOOL GARDEN



APPENDIX E: SPONSOR DESCRIPTION

Worcester Food Policy & Active Living Council

The Worcester Food Policy & Active Living Council will be sponsoring the Local Food Production and Food Systems IQP project at WPI for the 2012-2013 school year. Established in February of 2006, the WAFPC's mission is to "engage diverse partners to foster a healthy and just food system and active community environment" in Worcester, Massachusetts. Their overall purpose is to bring together the many components of the local food systems in Worcester, and help them solve the issues that arise within the city on a day-to-day basis. These local components include but are not limited to human service agencies, local hospitals and healthcare centers, schools, agriculture, distribution, businesses, social justice organizations, policy makers, public health organizations and anti-hunger advocates. The WAFPC has particular goals they look to succeed in every year. They wish to educate the city of Worcester about the local food systems and built environment issues that are concerning. They wish to advocate for environment, policy, and systems change in Worcester. Additionally they want to eliminate inequity as it relates to food access and a healthy environment. Most importantly they want to collaborate with local organizations to maximize efforts to promote change towards a healthy lifestyle. Lastly, the WAFPC wants to incorporate diversity in its members and perspectives so that the whole of the Worcester community is represented.

The WAFPC is a fairly young organization. In 2004, the Worcester County Hunger-Free Network was formed as a collaboration effort between the Worcester County Food Bank and its partner agencies that specialized in hunger relief throughout the region. In 2006 Congressman Jim McGovern, with help from then Lt. Governor Tim Murray created the Advisory Food Policy Council for Worcester, and the mayor officially established the Council in February of 2006. Its general purpose was to develop a "partnership of local and statewide nonprofit organizations, Worcester Public Schools and City departments, state agencies, health care providers, colleges and universities, faith based communities, and community members that meet together to discuss issues and projects related to hunger, food insecurity and nutrition". The Council still serves as an advisor to Congressman Jim McGovern.

In many communities throughout the United States, food shortage and insecurity, as well as hunger, continues to be a lingering problem. In Worcester alone, hunger is at a rate of six times the Massachusetts average. “In the 14 low-income neighborhoods in Worcester, one child in three lives in a family unable to meet its basic requirement for food”. This is a startling number that defines why the WAFPC was established in the first place, to combat this growing problem. In 2008, the Council did just that when they were awarded a Pilot Project Grant as part of a synergy initiative to pilot the project Hunger Free & Healthy. This project was developed to address the hunger and obesity issues in Worcester as they relate to community-wide health problems. Through creative solutions formed from the community itself, systematic changes can be established to better serve the Worcester community. This project was made possible through the funding of The Health Foundation of Central Massachusetts, which is a partner for the WAFPC. Some activities that have come from this project include increasing access to healthy foods. With the help of the Regional Environmental Council, the Main South Farmer’s market and mobile farmer’s market was established in Worcester, where low income residents can go to purchase produce and other things for extremely cheap prices. They have also continued to advocate for school nutrition by pushing for healthier, locally grown foods to be distributed in schools around Worcester.

APPENDIX F: LAND INVENTORY DATABASE

*This is an abbreviated version of the database that was created, due to space constraints. This is not representative of all the columns that are listed in the full version of the actual database. The full version can be seen on the website for the Center for Sustainable Food Systems at WPI, and will be distributed to interested urban agriculture stakeholders. This table serves to illustrate the most important components of the inventory and is a Master List of all the land that was identified during this project.

SITE	MAP ID	OWNER	AREA (SQ. FT.)	AREA (ACRES)	ZONE	#	STREET	GRND CVR
1	42-028-00009	AIRPORT INDUSTRIAL PARK	40856.00	0.94	RS-7	200	SWAN AVE	FOREST
2	42-027-00014	AIRPORT INDUSTRIAL PARK	56250.00	1.29	RS-7	0	FAIRVIEW AVE	FOREST
3	42-028-00011	AIRPORT INDUSTRIAL PARK	75998.00	1.74	RS-7	223	SWAN AVE	FOREST
4	42-028-00013	AIRPORT INDUSTRIAL PARK	86031.00	1.98	RS-7	121	SWAN AVE	FOREST
5	42-028-00010	AIRPORT INDUSTRIAL PARK	669735.00	15.38	RS-7	151	SWAN AVE	FOREST
6	56-012-00015	AIRPORT INDUSTRIAL PARK	747054.00	17.15	RS-7	150	SWAN AVE	FOREST
7	56-010-00008	AIRPORT INDUSTRIAL PARK	3857719.00	88.56	RS-7	130	SWAN AVE	FOREST
8	44-019-00001	CATHOLIC CHARITIES OF THE DIOCESE O	256119.00	5.88	RL-7	133	GRANITE ST	FOREST
9	07-024-00010	CITY OF WORC ECONOMIC DEVELOPMENT	69675.00	1.60	MG-2.0	17	SOUTHGATE PL	GRASS
10	07-024-01-03	CITY OF WORC ECONOMIC DEVELOPMENT	106336.00	2.44	MG-2.0	25	SOUTHGATE ST	GRASS
11	03-014-0012A	CITY OF WORC EOEND	2440.00	0.06	BG-3.0	8	CHANDLER ST	GRASS
12	06-035-00026	CITY OF WORC EOEND	3789.00	0.09	BL-1.0	2	KILBY ST	FOREST
13	06-016-00014	CITY OF WORC EOEND	4017.00	0.09	RG-5	9	DAVIS ST	GRASS
14	06-17A-00015	CITY OF WORC EOEND	4500.00	0.10	RG-5	7	JAQUES AVE	GRASS
15	06-17D-00082	CITY OF WORC EOEND	5275.00	0.12	RG-5	23	PRESTON ST	GRASS
16	06-034-00009	CITY OF WORC EOEND	5765.00	0.13	RG-5	33	RIPLEY ST	VEGETATED
17	06-007-00035	CITY OF WORC EOEND	7150.00	0.16	RG-5	33	MERRICK ST	VEGETATED
18	28-032-00004	CITY OF WORC EOEND	8256.00	0.19	ML-0.5	252	JAMES ST	FOREST
19	07-026-16-23	CITY OF WORC EOEND	75707.00	1.74	MG-2.0	49	CANTERBURY ST	VEGETATED
20	24-038-0004C	CITY OF WORC EOEND	90313.00	2.07	RS-7	164	SOUTH FLAGG ST	FOREST
21	09-042-00002	CITY OF WORC TAX TITLE CUSTODIAN	230.00	0.01	RL-7	1	ATWOOD RD	FOREST
22	19-010-00016	CITY OF WORC TAX TITLE CUSTODIAN	1349.00	0.03	BL-1.0	580	FRANKLIN ST	FOREST
23	29-010-00489	CITY OF WORC TAX TITLE CUSTODIAN	2235.00	0.05	RS-7	58	TENNYSON ST	FOREST
24	26-010-0039A	CITY OF WORC TAX TITLE CUSTODIAN	2310.00	0.05	RL-7	18	BOYDEN ST	VEGETATED
25	26-011-0016B	CITY OF WORC TAX TITLE CUSTODIAN	3066.00	0.07	RL-7	20	BOYDEN ST	VEGETATED
26	43-009-00032	CITY OF WORC TAX TITLE CUSTODIAN	3287.00	0.08	RS-7	57	NEWTON AVE	FOREST
27	25-049-0014A	CITY OF WORC TAX TITLE CUSTODIAN	3422.00	0.08	RS-10	1	OLD BROOK DR	VEGETATED
28	07-033-00022	CITY OF WORC TAX TITLE CUSTODIAN	3975.00	0.09	RG-5	479	CAMBRIDGE ST	VEGETATED

29	32-026-00006	CITY OF WORC TAX TITLE CUSTODIAN	9000.00	0.21	RL-7	14	GUILFORD ST	VEGETATED
30	01-011-00002	CITY OF WORC TAX TITLE CUSTODIAN	9612.00	0.22	RG-5	10	WINDSOR ST	GRASS
31	35-26B-70+71	CITY OF WORC TAX TITLE CUSTODIAN	12258.00	0.28	RL-7	51	BRIDGEPORT ST	FOREST
32	41-028-00060	CITY OF WORC TAX TITLE CUSTODIAN	12800.00	0.29	MG-0.5	1455	GRAFTON ST	FOREST
34	27-024-0004A	CITY OF WORC TAX TITLE CUSTODIAN	84343.00	1.94	MG-2.0	40	SUTTON LN	FOREST
35	37-015-00020	CITY OF WORC TAX TITLE CUSTODIAN	170755.00	3.92	RS-7	23	INDIAN HILL RD	FOREST
36	04-006-00047	CITY OF WORCESTER	250.00	0.01	RG-5	0	SHALE ST	GRASS
37	26-030-00003	CITY OF WORCESTER	637.00	0.01	RS-7	0	EPWORTH ST	FOREST
38	02-032-00031	CITY OF WORCESTER	1837.00	0.04	RG-5	7	JOHN ST	GRASS
39	56-011-28+29	CITY OF WORCESTER	3300.00	0.08	RL-7	56	REDFIELD RD	FOREST
40	06-006-00019	CITY OF WORCESTER	5845.00	0.13	RG-5	22	NEWBURY ST	VEGETATED
41	29-010-00016	CITY OF WORCESTER	6790.00	0.16	RS-7	108	EPWORTH ST	GRASS
42	47-008-00047	CITY OF WORCESTER	7500.00	0.17	RS-7	7	STONE HAVEN RD	FOREST
43	47-008-0017C	CITY OF WORCESTER	7500.00	0.17	RS-7	8	STONE HAVEN RD	FOREST
44	47-010-04-06	CITY OF WORCESTER	7500.00	0.17	RS-7	0	STONE HAVEN RD	FOREST
45	06-016-17+20	CITY OF WORCESTER	8166.00	0.19	RG-5	41	PIEDMONT ST	GRASS
46	18-036-00019	CITY OF WORCESTER	8405.00	0.19	RS-7	72	DARTMOUTH ST	FOREST
47	25-025-00011	CITY OF WORCESTER	13902.00	0.32	RS-10	100	FLAGG ST	VEGETATED
48	26-022-09-11	CITY OF WORCESTER	15061.00	0.35	RL-7	90	CLAY ST	FOREST
49	23-010-00002	CITY OF WORCESTER	16326.00	0.37	RS-7	536	BURNCOAT ST	GRASS
50	18-044-30-32	CITY OF WORCESTER	17094.00	0.39	RL-7	15	STRATFIELD ST	FOREST
51	18-001-00006	CITY OF WORCESTER	20358.00	0.47	RG-5	79	HOUGHTON ST	GRASS
52	46-033-00157	CITY OF WORCESTER	21725.00	0.50	RG-5	63	TACOMA ST	FOREST
53	25-041-00008	CITY OF WORCESTER	32100.00	0.74	RS-10	77	MORELAND ST	FOREST
54	18-037-003+5	CITY OF WORCESTER	34481.00	0.79	RS-7	73	DARTMOUTH ST	FOREST
55	18-030-00010	CITY OF WORCESTER	35000.00	0.80	RS-7	62	DARTMOUTH ST	FOREST
56	42-032-014-1	CITY OF WORCESTER	38491.00	0.88	RS-7	97	GATES LN	FOREST
57	17-002-00013	CITY OF WORCESTER	44338.00	1.02	RL-7	0	COBURN AVE	GRASS
58	17-31C-00445	CITY OF WORCESTER	50639.00	1.16	RL-7	1	TORKELSON RD	FOREST
59	18-037-00002	CITY OF WORCESTER	53200.00	1.22	RS-7	69	DARTMOUTH ST	FOREST
60	25-009-00024	CITY OF WORCESTER	53969.00	1.24	RS-7	31	BEACONSFIELD RD	FOREST
61	18-044-20-29	CITY OF WORCESTER	54636.00	1.25	RS-7	77	DARTMOUTH ST	FOREST
62	23-011-00005	CITY OF WORCESTER	55034.00	1.26	RS-7	524	BURNCOAT ST	GRASS
63	45-005-00001	CITY OF WORCESTER	63654.00	1.46	RS-7	26	PARK HILL RD	FOREST/GRASS
64	51-016-00003	CITY OF WORCESTER	64904.00	1.49	RS-7	200	MILL ST	FOREST/GRASS
65	18-037-01+04	CITY OF WORCESTER	72139.00	1.66	RS-7	65	DARTMOUTH ST	FOREST
66	18-026-6+972	CITY OF WORCESTER	78221.00	1.80	RS-7	59	DARTMOUTH ST	FOREST

67	56-INX-00M-2	CITY OF WORCESTER	85813.00	1.97	A-1	2	COPPAGE DR	FOREST/GRASS
68	15-010-00005	CITY OF WORCESTER	100188.00	2.30	RL-7	0	APRICOT ST	GRASS
69	47-018-03-L6	CITY OF WORCESTER	162784.00	3.74	A-1	89	PROUTY LN	FOREST
70	45-318-00019	CITY OF WORCESTER	202380.00	4.65	RS-7	22	BAILIN DR	VEGETATED
71	43-016-0000C	CITY OF WORCESTER	291852.00	6.70	RS-7	55	NEWTON AVE	FOREST
72	37-025-00002	CITY OF WORCESTER	296208.00	6.80	RS-7	85	SHORE DR	FOREST/GRASS
73	36-047-00003	CITY OF WORCESTER	347656.00	7.98	RS-7	0	CLARK ST	FOREST
74	14-020-00007	CITY OF WORCESTER	349787.00	8.03	RS-7	10	CIRCUIT AVE WEST	FOREST
76	52-007-02+2A	CITY OF WORCESTER	434017.00	9.96	BG-2.0	0	CLARK ST	VEGETATED
77	48-023-00002	CITY OF WORCESTER	491357.00	11.28	RS-7	539	MILL ST	FOREST
78	39-030-00003	CITY OF WORCESTER	559746.00	12.85	RS-7	75	TRINITY AVE	FOREST
79	42-026-00003	CITY OF WORCESTER	583268.00	13.39	RS-7	13	MONTICELLO DR	FOREST
80	02-INX-00001	CITY OF WORCESTER	784080.00	18.00	RL-7	121	RUSSELL ST	GRASS
81	19-026-018-2	CITY OF WORCESTER	836256.00	19.20	RS-7	0	CLARENDON ST	VEGETATED
82	01-01X-03-05	CITY OF WORCESTER	1055442.00	24.23	RL-7	82	SALISBURY ST	GRASS
83	22-INX-00001	CITY OF WORCESTER	1332936.00	30.60	RS-7	70	NORTH PKWY	FOREST/GRASS
84	54-006-0001A	CITY OF WORCESTER	1344261.00	30.86	RS-7	201	CATARACT ST	FOREST
85	41-047-00002	CITY OF WORCESTER	1437480.00	33.00	RL-7	300	LAKE AVE	FOREST
86	54-006-00002	CITY OF WORCESTER	1511532.00	34.70	RS-7	105	CATARACT ST	FOREST
87	54-006-00001	CITY OF WORCESTER	1568160.00	36.00	RS-7	151	CATARACT ST	FOREST
88	11-INX-00002	CITY OF WORCESTER	1829520.00	42.00	RL-7	339	HIGHLAND ST	FOREST
89	41-047-00001	CITY OF WORCESTER	2047320.00	47.00	RL-7	600	HAMILTON ST	FOREST
90	44-019-0000K	CITY OF WORCESTER	3405869.00	78.19	RS-7	0	GRANITE ST	FOREST
91	22-036-0025B	CITY OF WORCESTER CITY MANAGER	831.00	0.02	RS-7	63	BURNCOAT TER	FOREST
92	03-018-00023	CITY OF WORCESTER CITY MANAGER	1684.00	0.04	BG-6.0	46	AUSTIN ST	GRASS
93	14-008-00022	CITY OF WORCESTER CITY MANAGER	2518.00	0.06	RL-7	50	FAIRFIELD ST	VEGETATED
94	16-007-00014	CITY OF WORCESTER CITY MANAGER	4491.00	0.10	RG-5	0	RODNEY ST	VEGETATED
95	12-003-00043	CITY OF WORCESTER CITY MANAGER	10250.00	0.24	RS-7	32	WILKINSON ST	VEGETATED
96	37-029-00002	CITY OF WORCESTER CITY MANAGER	13213.00	0.30	RS-7	128	INDIAN HILL RD	FOREST/GRASS
97	01-032-0010A	CITY OF WORCESTER CITY MANAGER	18232.00	0.42	RG-5	69	LAUREL ST	GRASS
98	12-004-00024	CITY OF WORCESTER CITY MANAGER	34438.00	0.79	BL-1.0	329	WEST BOYLSTON ST	GRASS
99	52-007-02+2B	CITY OF WORCESTER CITY MANAGER	34533.00	0.79	RL-7	305	TACOMA ST	FOREST
100	08-051-00001	CITY OF WORCESTER CITY MANAGER	113256.00	2.60	ML-1.0	72	COES ST	GRASS
101	30-29A-00001	CITY OF WORCESTER CITY MANAGER	479160.00	11.00	RS-7	446	MILL ST	FOREST
102	28-019-00001	CITY OF WORCESTER CITY MANAGER	526120.00	12.08	MG-1.0	67	JAMES ST	FOREST
103	26-013-02+32	CITY OF WORCESTER COOKSON FLD	814572.00	18.70	RL-7	103	CLAY ST	FOREST
104	05-022-00003	CITY OF WORCESTER CROMPTON PARK	637283.00	14.63	RG-5	47	QUINSIGAMOND AVE	GRASS

105	07-007-01+02	CITY OF WORCESTER CRYSTAL PARK	596772.00	13.70	RG-5	965	MAIN ST	GRASS
106	22-009-00001	CITY OF WORCESTER DODGE PARK	566280.00	13.00	RS-7	81	RANDOLPH RD	GRASS
107	03-022-00036	CITY OF WORCESTER DPW	900.00	0.02	BG-6.0	8	CHESTNUT ST EXT	GRASS
108	16-007-100-1	CITY OF WORCESTER DPW	1125.00	0.03	RG-5	0	BELMONT ST	VEGETATED
109	08-031-00005	CITY OF WORCESTER DPW	1930.00	0.04	BG-2.0	8	MILL ST EXT	VEGETATED
110	05-041-00044	CITY OF WORCESTER DPW	2212.00	0.05	RG-5	15	MONTROSE ST	GRASS
111	08-050-0003C	CITY OF WORCESTER DPW	5000.00	0.11	ML-1.0	28	COES SQ	FOREST
112	08-031-0000D	CITY OF WORCESTER DPW	5553.00	0.13	BG-2.0	88	MILL ST EXT	VEGETATED
113	32-043-00004	CITY OF WORCESTER DPW	6202.00	0.14	RS-7	74	LANESBORO RD	GRASS
114	33-003-00015	CITY OF WORCESTER DPW	10675.00	0.25	RS-10	578	GROVE ST	FOREST/GRASS
115	54-001-00045	CITY OF WORCESTER DPW	192535.00	4.42	RS-7	3	DAWSON RD	FOREST
116	46-044-00001	CITY OF WORCESTER DPW	203142.00	4.66	BO-2.0	616	PLANTATION ST	FOREST
117	45-017-00001	CITY OF WORCESTER DPW	337590.00	7.75	RS-7	297	GRANITE ST	FOREST
118	35-035-00002	CITY OF WORCESTER DPW	3516163.00	80.72	RG-5	260	GRANITE ST	FOREST/GRASS
119	09-028-00038	CITY OF WORCESTER FAIRMONT PARK	41382.00	0.95	RG-5	22	HEMANS ST	GRASS
120	01-01X-00001	CITY OF WORCESTER FIRE DEPT	734.00	0.02	RL-7	141	GROVE ST	GRASS
121	15-029-00004	CITY OF WORCESTER HADWEN PARK	2184098.00	50.14	RS-7	19	HEARD ST	FOREST
122	21-INX-00012	CITY OF WORCESTER MORGAN PARK	487872.00	11.20	RS-7	550	GROVE ST	GRASS
123	57-003-0003B	CITY OF WORCESTER PARKS DEPT	9468.00	0.22	RG-5	110	GREEN HILL PKWY	FOREST
124	57-003-0003C	CITY OF WORCESTER PARKS DEPT	13152.00	0.30	RS-7	251	BELMONT ST	GRASS
125	14-021-00003	CITY OF WORCESTER PARKS DEPT	14400.00	0.33	RS-7	20	VINCENT AVE	GRASS
126	16-017-00010	CITY OF WORCESTER PARKS DEPT	26654.00	0.61	RL-7	1	CHILMARK ST	FOREST
127	52-INX-0001E	CITY OF WORCESTER PARKS DEPT	83138.00	1.91	BG-2.0	0	NORTHEAST CUTOFF	GRASS
128	02-024-00002	CITY OF WORCESTER PARKS DEPT	121968.00	2.80	BG-6.0	99	FRONT ST	FOREST/GRASS
129	06-018-00013	CITY OF WORCESTER PARKS DEPT	136041.00	3.12	RG-5	20	ALDEN ST	GRASS
130	52-INX-00004	CITY OF WORCESTER PARKS DEPT	303177.00	6.96	RL-7	285	TACOMA ST	FOREST
131	31-025-00001	CITY OF WORCESTER PARKS DEPT	310583.00	7.13	RL-7	75	MCKEON RD	FOREST
132	14-033-00001	CITY OF WORCESTER PARKS DEPT	560876.00	12.88	BG-4.0	80	MAYFIELD ST	GRASS
133	29-008-00001	CITY OF WORCESTER PARKS DEPT	655091.00	15.04	RS-7	14	FORSBERG ST	FOREST
134	16-015-0009B	CITY OF WORCESTER PARKS DEPT	999631.00	22.95	RG-5	180	SHREWSBURY ST	FOREST/GRASS
135	16-015-0009A	CITY OF WORCESTER PARKS DEPT	1007249.00	23.12	RG-5	190	BELMONT ST	FOREST/GRASS
136	17-017-00001	CITY OF WORCESTER RAMSHORN ISL	65340.00	1.50	BL-1.0	422	BELMONT ST	FOREST
137	20-015-00001	CITY OF WORCESTER SALISBURY PK	513572.00	11.79	RS-10	26	MASSACHUSETTS AVE	FOREST
138	03-022-00037	CITY OF WORCESTER SCHOOL DEPT	900.00	0.02	BG-6.0	21	IRVING ST	VEGETATED
139	03-022-00035	CITY OF WORCESTER SCHOOL DEPT	2000.00	0.05	BG-6.0	42	CHATHAM ST	GRASS
140	35-028-0000V	CITY OF WORCESTER SCHOOL DEPT	11144.00	0.26	RL-7	116	LOXWOOD ST	FOREST
141	35-028-0001C	CITY OF WORCESTER SCHOOL DEPT	38803.00	0.89	RL-7	118	LOXWOOD ST	FOREST

142	35-028-0000S	CITY OF WORCESTER SCHOOL DEPT	51997.00	1.19	RL-7	114	LOXWOOD ST	FOREST
143	35-26A-0000A	CITY OF WORCESTER SCHOOL DEPT	86600.00	1.99	RL-7	120	GRANITE ST	GRASS
144	48-015-00001	CITY OF WORCESTER SCHOOL DEPT	87120.00	2.00	IN-5	275	MAY ST	FOREST
145	35-028-0001B	CITY OF WORCESTER SCHOOL DEPT	199940.00	4.59	RL-7	239	PROVIDENCE ST	FOREST/GRASS
146	37-029-0001B	CITY OF WORCESTER SCHOOL DEPT	213444.00	4.90	RS-7	165	ARARAT ST	FOREST
147	39-027-00001	CITY OF WORCESTER SCHOOL DEPT	248094.00	5.70	BL-1.0	549	LINCOLN ST	FOREST
148	42-025-0004A	CITY OF WORCESTER SCHOOL DEPT	271814.00	6.24	RL-7	337	MILL ST	FOREST
149	34-025-003+5	CITY OF WORCESTER SCHOOL DEPT	406347.00	9.33	RL-7	1006	GRAFTON ST	GRASS
150	21-002-00002	CITY OF WORCESTER SCHOOL DEPT	411642.00	9.45	RS-7	35	NELSON PL	FOREST
151	43-01D-00081	CITY OF WORCESTER SCHOOL DEPT	431244.00	9.90	RS-10	115	FLAGG ST	FOREST/GRASS
152	36-38A-00001	CITY OF WORCESTER SCHOOL DEPT	445307.00	10.22	RL-7	321	SAINT NICHOLAS AVE	FOREST/GRASS
153	52-007-00001	CITY OF WORCESTER SCHOOL DEPT	696960.00	16.00	BG-2.0	280	CLARK ST	FOREST/GRASS
154	30-08A-00005	CITY OF WORCESTER SCHOOL DEPT	957450.00	21.98	RS-7	525	CHANDLER ST	FOREST
155	20-033-00001	CITY OF WORCESTER SCHOOL DEPT	1259605.00	28.92	RS-10	495	GROVE ST	VEGETATED
156	47-021-0A+A1	CITY OF WORCESTER SCHOOL DEPT	1481040.00	34.00	RS-7	300	MOWER ST	FOREST
157	41-036-0034A	CITY OF WORCESTER SEWER DEPT	3594.00	0.08	RS-7	47	PINELAND AVE	GRASS
158	29-047-007-1	CITY OF WORCESTER SEWER DEPT	4357.00	0.10	BL-1.0	351	GREENWOOD ST	FOREST
159	17-039-00031	CITY OF WORCESTER SEWER DEPT	11785.00	0.27	RL-7	15	BIRD ST	VEGETATED
160	16-017-0006B	CITY OF WORCESTER SEWER DEPT	30850.00	0.71	RG-5	102	ELLIOTT ST	FOREST
161	44-003-00538	CITY OF WORCESTER SEWER DEPT	55000.00	1.26	RS-7	76	DUNKIRK AVE	FOREST
162	29-047-00006	CITY OF WORCESTER SEWER DEPT	4316683.00	99.10	MG-2.0	0	GREENWOOD ST	GRASS
163	01-022-00003	CITY OF WORCESTER STREET DEPT	4781.00	0.11	BG-6.0	0	BELMONT ST	VEGETATED
164	42-002-00001	CITY OF WORCESTER STREET DEPT	10600.00	0.24	RS-7	75	SYLVAN ST	GRASS
165	24-041-00065	CITY OF WORCESTER STREET DEPT	14175.00	0.33	RS-7	122	SOUTH FLAGG ST	FOREST
166	43-016-0000A	CITY OF WORCESTER STREET DEPT	49009.00	1.13	RS-7	26	NEWTON AVE	VEGETATED
167	25-049-0014B	CITY OF WORCESTER TAX TITLE	6296.00	0.14	RS-10	0	OLD BROOK DR	FOREST
168	04-011-0000B	CITY OF WORCESTER UNITY PARK	36455.00	0.84	RG-5	40	WALL ST	VEGETATED
169	15-010-00013	CITY OF WORCESTER WATER DEPT	1224.00	0.03	RL-7	20	MERCHANT ST	FOREST
170	47-16C-0000C	CITY OF WORCESTER WATER DEPT	4559.00	0.10	RS-7	45	FOXMEADOW DR	GRASS
171	33-030-00110	CITY OF WORCESTER WATER DEPT	47045.00	1.08	RS-7	56	CHESTER ST	GRASS
172	47-016-0000A	CITY OF WORCESTER WATER DEPT	85208.00	1.96	RS-7	130	BAILEY ST	FOREST
173	56-010-00013	CITY OF WORCESTER WATER DEPT	294291.00	6.76	A-1	0	APRICOT ST	FOREST/GRASS
174	54-004-00001	CITY OF WORCESTER WATER DEPT	501811.00	11.52	RS-7	216	OLEAN ST	FOREST
175	56-016-00003	CITY OF WORCESTER WATER DEPT	531432.00	12.20	RL-7	11	GODDARD MEMORIAL DR	FOREST
176	31-001-0000B	COMM OF MA HIGHWAY DEPT	6375.00	0.15	BL-1.0	1331	MILLBURY ST	GRASS
177	32-041-00001	COMM OF MASS	237992.00	5.46	BL-1.0	1175	WEST BOYLSTON ST	FOREST
178	53-INX-	COMM OF MASS CORRECTIONS & DYS	11025.00	0.25	RL-7	0	BRIAR LN	FOREST

	0005B							
179	53-INX-0005A	COMM OF MASS CORRECTIONS + DYS	11025.00	0.25	RL-7	0	BRIAR LN	GRASS
180	48-019-056B1	COMM OF MASS EDUCATION	224.00	0.01	RS-7	102	CHICOPEE	FOREST
181	48-019-057B1	COMM OF MASS EDUCATION	224.00	0.01	RS-7	96	CHICOPEE	FOREST
182	48-019-5253B	COMM OF MASS EDUCATION	224.00	0.01	RS-7	34	GLENDALE ST	FOREST
183	46-015-0075A	COMM OF MASS EDUCATION	872.00	0.02	RL-7	107	NATURAL HISTORY DR	FOREST
184	48-018-7172B	COMM OF MASS EDUCATION	2000.00	0.05	RS-7	17	CANDLEWOOD ST	FOREST
185	46-006-00272	COMM OF MASS EDUCATION	5000.00	0.11	RL-7	50	BELCOURT RD	FOREST
186	46-013-00156	COMM OF MASS EDUCATION	5169.00	0.12	RL-7	84	WAUWINET RD	FOREST
187	46-015-69+70	COMM OF MASS EDUCATION	6716.00	0.15	RL-7	0	WIGWAM HILL DR	FOREST
188	48-016-001B1	COMM OF MASS EDUCATION	12150.00	0.28	IN-S	486	CHANDLER ST	FOREST
189	46-006-00280	COMM OF MASS EDUCATION	12500.00	0.29	RL-7	32	BELCOURT RD	FOREST
190	46-013-00152	COMM OF MASS EDUCATION	12502.00	0.29	RL-7	86	WAUWINET RD	FOREST
191	46-006-00274	COMM OF MASS EDUCATION	15000.00	0.34	RL-7	40	BELCOURT RD	FOREST
192	48-019-00056	COMM OF MASS EDUCATION	16756.00	0.38	RS-7	102	CHICOPEE ST	FOREST
193	48-019-00057	COMM OF MASS EDUCATION	17150.00	0.39	RS-7	96	CHICOPEE ST	FOREST
194	48-019-52+53	COMM OF MASS EDUCATION	23732.00	0.54	RS-7	134	GLENDALE ST	FOREST
195	48-018-71+72	COMM OF MASS EDUCATION	25299.00	0.58	RS-7	17	CANDLEWOOD ST	FOREST
196	46-009-00358	COMM OF MASS EDUCATION	27242.00	0.63	RL-7	2	ROSLYN RD	FOREST
197	46-011-00166	COMM OF MASS EDUCATION	65257.00	1.50	RL-7	70	WAUWINET RD	FOREST
198	48-019-58-61	COMM OF MASS EDUCATION	90616.00	2.08	RS-7	64	CHICOPEE ST	FOREST
199	46-008-00383	COMM OF MASS EDUCATION	91976.00	2.11	RL-7	5	ROSLYN RD	FOREST
200	46-010-19+51	COMM OF MASS EDUCATION	102000.00	2.34	RL-7	21	WIGWAM HILL DR	FOREST
201	48-017-82-84	COMM OF MASS EDUCATION	157687.00	3.62	RS-7	18	CHICOPEE ST	FOREST
202	23-019-00002	COMM OF MASS EDUCATION	2182976.00	50.11	RL-7	670	WEST BOYLSTON ST	GRASS
203	23-019-00002	COMM OF MASS EDUCATION	2182976.00	50.11	RL-7	670	WEST BOYLSTON ST	FOREST
204	23-019-00002	COMM OF MASS EDUCATION	2182976.00	50.11	RL-7	670	WEST BOYLSTON ST	GRASS
205	23-019-00002	COMM OF MASS EDUCATION	2182976.00	50.11	RL-7	670	WEST BOYLSTON ST	GRASS
206	41-034-00009	COMM OF MASS ENVIRONMENTAL MNGT	1608.00	0.04	RS-7	1	PINELAND AVE	FOREST
207	31-024-00001	COMM OF MASS ENVIRONMENTAL MNGT	277041.00	6.36	MG-0.5	1200	MILLBURY ST	FOREST
208	41-047-00004	COMM OF MASS ENVIRONMENTAL MNGT	984456.00	22.60	RL-7	283	LAKE AVE	FOREST/GRASS
209	31-020-0001A	COMM OF MASS HIGHWAY	53342.00	1.22	ML-2.0	35	TOBIAS BOLAND WAY	GRASS/WATER
210	32-012-00164	COMM OF MASS HIGHWAY DEPT	1980.00	0.05	RS-7	0	MALDEN ST	FOREST
211	57-001-005B1	COMM OF MASS HIGHWAY DEPT	2500.00	0.06	IN-H	0	BELMONT ST	GRASS
212	37-033-0000Y	COMM OF MASS HIGHWAY DEPT	2671.00	0.06	RS-7	0	SUNRISE AVE	GRASS
213	45-004-0082B	COMM OF MASS HIGHWAY DEPT	3815.00	0.09	ML-0.5	501	SOUTHWEST CUTOFF	VEGETATED
214	37-033-0000X	COMM OF MASS HIGHWAY DEPT	4148.00	0.10	RS-7	0	SUNRISE AVE	FOREST

215	32-030-00142	COMM OF MASS HIGHWAY DEPT	5315.00	0.12	RL-7	66	WILBUR ST	FOREST
216	34-033-00010	COMM OF MASS HIGHWAY DEPT	6458.00	0.15	ML-0.5	537	MASSASOIT RD	VEGETATED
217	32-012-00005	COMM OF MASS HIGHWAY DEPT	7259.00	0.17	RS-7	148	MALDEN ST	GRASS
218	37-007-00040	COMM OF MASS HIGHWAY DEPT	8898.00	0.20	RS-7	2	RODBY ST	VEGETATED
219	32-012-00003	COMM OF MASS HIGHWAY DEPT	11902.00	0.27	RS-7	150	MALDEN ST	VEGETATED
220	10-029-00010	COMM OF MASS HIGHWAY DEPT	15935.00	0.37	BL-1.0	571	MILLBURY ST	FOREST/GRASS
221	31-016-59+65	COMM OF MASS HIGHWAY DEPT	19059.00	0.44	BL-1.0	0	MILLBURY ST	FOREST
222	05-029-00003	COMM OF MASS HIGHWAY DEPT	21539.00	0.49	BL-1.0	4	WHITNEY ST	GRASS
223	32-001-00018	COMM OF MASS HIGHWAY DEPT	23515.00	0.54	BL-1.0	1	MALDEN ST	GRASS
224	07-037-00014	COMM OF MASS HIGHWAY DEPT	34324.00	0.79	MG-2.0	0	SOUTH CAMBRIDGE ST	FOREST/GRASS
225	32-012-00037	COMM OF MASS HIGHWAY DEPT	38695.00	0.89	RS-7	0	MALDEN ST	VEGETATED
226	31-001-3A-3B	COMM OF MASS HIGHWAY DEPT	48125.00	1.10	BL-1.0	1329	MILLBURY ST	FOREST/GRASS
227	31-015-00001	COMM OF MASS HIGHWAY DEPT	57081.00	1.31	BG-2.0	0	MILLBURY ST	VEGETATED
228	05-030-00001	COMM OF MASS HIGHWAY DEPT	86375.00	1.98	BL-1.0	446	MILLBURY ST	GRASS
229	13-035-0001A	COMM OF MASS HIGHWAY DEPT	182360.00	4.19	RG-5	149	WEST BOYLSTON DR	VEGETATED
230	49-048-00002	COMM OF MASS HIGHWAY DEPT	472406.00	10.84	RS-7	0	MOUNTAIN ST WEST	FOREST
231	13-003-00001	COMM OF MASS HIGHWAY DEPT	528048.00	12.12	RG-5	124	WEST BOYLSTON DR	VEGETATED
232	13-003-00001	COMM OF MASS HIGHWAY DEPT	528048.00	12.12	RG-5	124	WEST BOYLSTON DR	GRASS
233	49-048-00003	COMM OF MASS HIGHWAY DEPT	631184.00	14.49	RS-7	0	MALDEN ST	FOREST
234	31-023-0001A	COMM OF MASS HIGHWAY DEPT	724700.00	16.64	MG-0.5	1130	MILLBURY ST	FOREST
235	31-020-00001	COMM OF MASS HIGHWAY DEPT	994910.00	22.84	MG-2.0	0	MILLBURY ST	GRASS/WATER
236	49-048-00001	COMM OF MASS HIGHWAY DEPT	1315512.00	30.20	RS-7	173	MOUNTAIN ST WEST	FOREST/GRASS
237	57-004-0000B	COMM OF MASS MENTAL HEALTH	4903985.00	112.58	BG-2.0	305	BELMONT ST	FOREST/GRASS
238	32-019-00269	COMM OF MASS METROPOLITAN DISTRICT	8915.00	0.20	RL-7	2	FAIRCHILD AVE	FOREST
239	08-028-00017	GREATER WORCESTER LAND TRUST	4900.00	0.11	RG-5	33	STAFFORD ST	FOREST
240	24-038-004-2	GREATER WORCESTER LAND TRUST	7000.00	0.16	RS-7	180	SOUTH FLAGG ST	FOREST
241	49-037-008-1	GREATER WORCESTER LAND TRUST	7690.00	0.18	RS-7	106	BATTLE ST	FOREST
242	15-044-00131	GREATER WORCESTER LAND TRUST	17908.00	0.41	RS-7	7	MERRIDALE ST	FOREST
243	50-011-00001	GREATER WORCESTER LAND TRUST	20000.00	0.46	RS-7	102	BRIGHAM RD	FOREST
244	50-014-00003	GREATER WORCESTER LAND TRUST	20000.00	0.46	RS-7	114	BRIGHAM RD	FOREST
245	20-020-00A+B	GREATER WORCESTER LAND TRUST	51146.00	1.17	RS-10	11	HOWATSON WAY	FOREST
246	50-011-00003	GREATER WORCESTER LAND TRUST	70000.00	1.61	RS-7	96	BRIGHAM RD	FOREST
247	54-009-04A-9	GREATER WORCESTER LAND TRUST	93392.00	2.14	RS-7	0	OLEAN ST	FOREST
248	20-020-00019	GREATER WORCESTER LAND TRUST	118800.00	2.73	RS-10	5	HOWATSON WAY	FOREST
249	15-050-0001A	GREATER WORCESTER LAND TRUST	186001.00	4.27	RS-7	3	LUDLOW ST	FOREST
250	49-42A-0000X	GREATER WORCESTER LAND TRUST	310230.00	7.12	RS-7	0	CORINTH DR	FOREST/GRASS
251	15-43A-00002	GREATER WORCESTER LAND TRUST	413820.00	9.50	RS-7	17	ALDEN RD	FOREST

252	56-016-09+10	GREATER WORCESTER LAND TRUST	1228392.00	28.20	A-1	0	GODDARD MEMORIAL DR	FOREST/GRASS
253	49-037-00008	GREATER WORCESTER LAND TRUST	1569902.00	36.04	RS-7	108	BRATTLE ST	FOREST/GRASS
254	33-042-0001B	GREATER WORCESTER LAND TRUST	2028153.00	46.56	RS-7	770	GROVE ST	FOREST
255	37-023-0000R	GREATER WORCESTER LAND TRUST	3368968.00	77.34	RS-7	9	SUNRISE AVE	FOREST
256	51-011-00002	KNIGHTS OF COLUMBUS RELIGIOUS	307158.00	7.05	RS-7	70	CIRCUIT AVE NORTH	FOREST
257	45-015-0000B	MASSACHUSETTS AUDUBON SOCIETY INC	15117.00	0.35	RS-7	0	PARK HILL RD	FOREST
258	45-028-00002	MASSACHUSETTS AUDUBON SOCIETY INC	76665.00	1.76	RS-7	8	SPRAGUE LN	FOREST
259	44-015-00002	MASSACHUSETTS AUDUBON SOCIETY INC	133179.00	3.06	RS-7	254	MASSASOIT RD	FOREST
260	45-023-00100	MASSACHUSETTS AUDUBON SOCIETY INC	152460.00	3.50	RS-7	4	CREST AVE	FOREST
261	45-023-00001	MASSACHUSETTS AUDUBON SOCIETY INC	348915.00	8.01	RS-7	7	HJELM AVE	FOREST
262	45-031-00002	MASSACHUSETTS AUDUBON SOCIETY INC	641996.00	14.74	RS-7	414	MASSASOIT RD	FOREST
263	45-033-00008	NEW ENGLAND POWER COMPANY	242156.00	5.56	ML-0.5	482	SOUTHWEST CUTOFF	FOREST
264	45-033-00006	NEW ENGLAND POWER COMPANY	271776.00	6.24	RS-7	504	MASSASOIT RD	FOREST
265	45-032-02+03	NEW ENGLAND POWER COMPANY	4704480.00	108.00	RS-7	414	MASSASOIT RD	FOREST
266	36-017-00322	WORCESTER CONSERVATION COMMISSION	3982.00	0.09	RS-7	1	BANNISER ST	FOREST
267	34-29B-82+84	WORCESTER CONSERVATION COMMISSION	5000.00	0.11	RS-7	16	ELLEN ST	FOREST
268	34-29C-00021	WORCESTER CONSERVATION COMMISSION	5000.00	0.11	RS-7	45	MARGIN ST	FOREST
269	34-29C-0021A	WORCESTER CONSERVATION COMMISSION	5000.00	0.11	RS-7	47	MARGIN ST	FOREST
270	44-003-00549	WORCESTER CONSERVATION COMMISSION	5000.00	0.11	RS-7	71	EVERTON AVE	FOREST
271	44-003-00567	WORCESTER CONSERVATION COMMISSION	5000.00	0.11	RS-7	85	EVERTON AVE	FOREST
272	34-29B-00004	WORCESTER CONSERVATION COMMISSION	7500.00	0.17	RS-7	18	ELLEN ST	FOREST
273	34-29B-00199	WORCESTER CONSERVATION COMMISSION	7500.00	0.17	RS-7	55	MARGIN ST	FOREST
274	41-017-00240	WORCESTER CONSERVATION COMMISSION	7500.00	0.17	RL-7	17	EMPIRE ST	VEGETATED
275	44-003-00564	WORCESTER CONSERVATION COMMISSION	7500.00	0.17	RS-7	83	EVERTON AVE	FOREST
276	24-002-00002	WORCESTER CONSERVATION COMMISSION	7800.00	0.18	RS-7	44	IOWA ST	FOREST
277	45-011-0049A	WORCESTER CONSERVATION COMMISSION	8000.00	0.18	RS-7	0	ROOSEVELT AVE	FOREST
278	34-29B-00204	WORCESTER CONSERVATION COMMISSION	11500.00	0.26	RS-7	37	ELLEN ST	FOREST
279	45-015-00004	WORCESTER CONSERVATION COMMISSION	11633.00	0.27	RS-7	0	PARK HILL RD	FOREST
280	45-015-00006	WORCESTER CONSERVATION COMMISSION	12171.00	0.28	RS-7	0	PARK HILL RD	FOREST
281	34-29B-00006	WORCESTER CONSERVATION COMMISSION	12500.00	0.29	RS-7	33	ELLEN ST	FOREST
282	44-003-00551	WORCESTER CONSERVATION COMMISSION	12500.00	0.29	RS-7	75	EVERTON AVE	FOREST
283	45-020-00149	WORCESTER CONSERVATION COMMISSION	13542.00	0.31	RS-7	14	HJELM AVE	FOREST
284	45-015-00010	WORCESTER CONSERVATION COMMISSION	13992.00	0.32	RS-7	0	PARK HILL RD	FOREST
285	24-008-0007C	WORCESTER CONSERVATION COMMISSION	14115.00	0.32	RS-7	50	CHAMBERLAIN PKWY	FOREST
286	45-015-00007	WORCESTER CONSERVATION COMMISSION	14800.00	0.34	RS-7	0	PARK HILL RD	FOREST
287	34-29B-15-20	WORCESTER CONSERVATION COMMISSION	15000.00	0.34	RS-7	16	NILES ST	FOREST

288	24-004-0010A	WORCESTER CONSERVATION COMMISSION	15540.00	0.36	RS-7	47	IOWA ST	FOREST
289	45-015-00009	WORCESTER CONSERVATION COMMISSION	17226.00	0.40	RS-7	0	PARK HILL RD	FOREST
290	34-29B-00002	WORCESTER CONSERVATION COMMISSION	17400.00	0.40	RS-7	26	ELLEN ST	FOREST
291	49-038-00005	WORCESTER CONSERVATION COMMISSION	18032.00	0.41	RS-7	130	BRATTLE ST	FOREST
292	24-002-00009	WORCESTER CONSERVATION COMMISSION	18660.00	0.43	RS-7	48	IOWA ST	FOREST
293	41-003-00102	WORCESTER CONSERVATION COMMISSION	18900.00	0.43	RL-7	380	LAKE AVE	FOREST
294	31-011-00002	WORCESTER CONSERVATION COMMISSION	19500.00	0.45	RL-7	73	SAINT LOUIS ST	FOREST
295	34-29B-00008	WORCESTER CONSERVATION COMMISSION	20000.00	0.46	RS-7	51	MARGIN ST	FOREST
296	36-017-00306	WORCESTER CONSERVATION COMMISSION	20000.00	0.46	RS-7	17	GOTHIC AVE	FOREST
297	44-003-00556	WORCESTER CONSERVATION COMMISSION	20000.00	0.46	RS-7	81	EVERTON AVE	FOREST
298	44-004-00580	WORCESTER CONSERVATION COMMISSION	22973.00	0.53	RL-7	100	EVERTON AVE	FOREST
299	24-040-00099	WORCESTER CONSERVATION COMMISSION	23045.00	0.53	RS-7	42	WESTVIEW RD	FOREST
300	45-015-001-3	WORCESTER CONSERVATION COMMISSION	24151.00	0.55	RS-7	0	PARK HILL RD	FOREST
301	34-29C-00018	WORCESTER CONSERVATION COMMISSION	25000.00	0.57	RS-7	29	ELLEN ST	FOREST
302	45-015-0002A	WORCESTER CONSERVATION COMMISSION	25382.00	0.58	RS-7	0	PARK HILL RD	FOREST
303	45-024-00334	WORCESTER CONSERVATION COMMISSION	26730.00	0.61	RS-7	61	JULIEN AVE	FOREST
304	45-015-00001	WORCESTER CONSERVATION COMMISSION	27637.00	0.63	RS-7	59	PARK HILL RD	FOREST
305	34-29B-00001	WORCESTER CONSERVATION COMMISSION	30200.00	0.69	RS-7	21	NILES ST	FOREST
306	45-015-00008	WORCESTER CONSERVATION COMMISSION	30567.00	0.70	RS-7	0	PARK HILL RD	FOREST
307	32-026-00428	WORCESTER CONSERVATION COMMISSION	32591.00	0.75	RL-7	23	AROOSTOOK ST	VEGETATED
308	54-002-00038	WORCESTER CONSERVATION COMMISSION	33100.00	0.76	RS-7	60	DAWSON RD	FOREST
309	45-025-00040	WORCESTER CONSERVATION COMMISSION	33880.00	0.78	RS-7	20	ECHO ST	FOREST
310	31-008-09-12	WORCESTER CONSERVATION COMMISSION	34560.00	0.79	RL-7	4	GUSTAVUS AVE	VEGETATED
311	34-29B-21-37	WORCESTER CONSERVATION COMMISSION	42500.00	0.98	RS-7	20	NILES ST	FOREST
312	36-017-00314	WORCESTER CONSERVATION COMMISSION	42616.00	0.98	RS-7	50	GOVERNORS ST	FOREST
313	54-001-00070	WORCESTER CONSERVATION COMMISSION	42885.00	0.98	RS-7	79	DAWSON RD	FOREST
314	46-026-00559	WORCESTER CONSERVATION COMMISSION	45935.00	1.05	RS-7	55	WHITE AVE	FOREST
315	36-017-00323	WORCESTER CONSERVATION COMMISSION	46061.00	1.06	RS-7	351	GOVERNORS ST	FOREST
316	44-003-00459	WORCESTER CONSERVATION COMMISSION	50000.00	1.15	RS-7	82	DUNKIRK AVE	FOREST
317	44-004-00569	WORCESTER CONSERVATION COMMISSION	51542.00	1.18	RS-7	104	EVERTON AVE	FOREST
318	45-021-00001	WORCESTER CONSERVATION COMMISSION	57079.00	1.31	RS-7	19	HJELM AVE	FOREST
319	50-012-06-08	WORCESTER CONSERVATION COMMISSION	60000.00	1.38	RS-7	4	HOOSAC ST	FOREST
320	49-029-00046	WORCESTER CONSERVATION COMMISSION	104544.00	2.40	RS-7	80	DARNELL RD	FOREST
321	45-021-00002	WORCESTER CONSERVATION COMMISSION	108900.00	2.50	RS-7	17	HJELM AVE	FOREST
322	38-010-00002	WORCESTER CONSERVATION COMMISSION	112820.00	2.59	RL-7	23	LORENZO ST	FOREST
323	31-008-00006	WORCESTER CONSERVATION COMMISSION	116089.00	2.67	RL-7	2	GUSTAVUS AVE	VEGETATED

324	24-008-00001	WORCESTER CONSERVATION COMMISSION	118858.00	2.73	RS-7	10	WESTVIEW RD	FOREST
325	46-026-0000A	WORCESTER CONSERVATION COMMISSION	144922.00	3.33	RS-7	105	WAYSIDE RD	FOREST
326	44-017-00003	WORCESTER CONSERVATION COMMISSION	174240.00	4.00	RS-7	228	MASSASOIT RD	FOREST
327	25-048-00005	WORCESTER CONSERVATION COMMISSION	336402.00	7.72	RS-10	238	MORELAND ST	FOREST
328	19-29A-01B-2	WORCESTER CONSERVATION COMMISSION	368668.00	8.46	RS-7	0	HARRINGTON WAY	VEGETATED
329	38-027-00001	WORCESTER CONSERVATION COMMISSION	401188.00	9.21	RS-7	901	GRAFTON ST	FOREST
330	50-015-00008	WORCESTER CONSERVATION COMMISSION	518150.00	11.90	RS-7	1	HOOSAC ST	FOREST
331	25-045-00010	WORCESTER CONSERVATION COMMISSION	578315.00	13.28	RS-10	178	MORELAND ST	FOREST
332	45-014-00002	WORCESTER CONSERVATION COMMISSION	653400.00	15.00	RS-7	59	DANE AVE	FOREST
333	41-017-00001	WORCESTER CONSERVATION COMMISSION	682717.00	15.67	RL-7	100	NONQUIT ST	VEGETATED
334	45-014-00001	WORCESTER CONSERVATION COMMISSION	757944.00	17.40	RS-7	375	GRANITE ST	FOREST
335	45-011-00100	WORCESTER CONSERVATION COMMISSION	879494.00	20.19	RS-7	1	PENNSYLVANIA AVE	FOREST
336	54-002-00001	WORCESTER CONSERVATION COMMISSION	1694484.00	38.90	RS-7	80	DAWSON RD	FOREST
337	44-018-00001	WORCESTER CONSERVATION COMMISSION	1815145.00	41.67	RS-7	414	MASSASOIT RD	FOREST/GRASS
338	45-033-00001	WORCESTER CONSERVATION COMMISSION	2088266.00	47.94	RS-7	504	MASSASOIT RD	FOREST
339	38-024-00001	WORCESTER CONSERVATION COMMISSION	2807878.00	64.46	BG-2.0	55	JOLMA RD	FOREST