

*Envisioning a Food Garden  
on the  
Rose Fitzgerald Kennedy Greenway*



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*Food is our common ground, a universal experience.*

*-- James Beard*

## **I. Introduction**

In the summer of 2006, Roy Blomquist of the Massachusetts Horticultural Society and Professor Kathleen Merrigan of Tufts University met to explore the potential of collaborating on issues related to the Rose Fitzgerald Kennedy Greenway. Immediately, they were struck with the idea of carving out a small parcel of land on the Greenway for a demonstration food garden. Why? Because, as James Beard observes, food is our common ground. A food garden could reconnect urban dwellers with food production, teach children science through gardening, and expose history and cultures through food traditions.

But this idea of a demonstration food garden needed refinement. The garden would demonstrate what and to whom? What foods should be grown? What potential obstacles might be encountered in placing a food garden in the midst of heavy vehicle and pedestrian traffic? To address these questions and many more, a team was formed of graduate students and the faculty director of the Agriculture, Food and Environment (AFE) Program of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts University in Boston, Massachusetts.

This report is the culmination of that team effort. It is being submitted to the Massachusetts Horticultural Society and their many collaborators, state and federal transportation officials, and community-based organizations involved in designing the Greenway. We hope that it inspires additional work and ultimately culminates in the establishment of a Greenway food garden.

## II. Project Background

### *The Rose Fitzgerald Kennedy Greenway*

In 1987, following an Act of Congress, the United States Department of Transportation, the Federal Highway Administration, and the Massachusetts Turnpike Authority (MTA) undertook one of the largest civil works projects in U.S. history—tearing down an old elevated six-lane highway in the city of Boston known as the “Central Artery” and moving it underground into a series of tunnels (see Figure 1). The old elevated highway had run through the center of downtown, essentially cutting off the Italian North End and Waterfront neighborhoods from the rest of the city, thwarting cohesive city life and stunting economic development.<sup>1</sup> This project, popularly referred to as “The Big Dig,” had three goals: to ameliorate traffic problems, to reconnect Boston neighborhoods, and to create an open green space for the public to enjoy. The tract of land vacated by the former Central Artery was to be developed into a grand green promenade (see Figures 2a-c) named the Rose Fitzgerald Kennedy Greenway after the matriarch of one of Boston’s most prominent families.<sup>2</sup>

Following 20 years of planning and construction, residents look forward to the Greenway as their long-awaited reward for enduring the inconvenience and frustration of the mammoth Big Dig project. This anticipation coupled with the much-discussed potential for the centrally-located 27 acres of green space, evokes passionate debate about the design and use of the Greenway among citizens of the greater Boston community.

The original Environmental Certification for the Big Dig specified that 75% of the 27 acres of land freed up by the removal of the Central Artery was to remain open and undeveloped.<sup>3</sup> Control over the Greenway acres became the source of tremendous turmoil among city, state, and community groups. In 2004, after years of debate over who should control the land, the MTA, the Commonwealth of Massachusetts, the City of Boston and the Kennedy family established an independent nonprofit entity to manage the project.



**Figure 1.** The elevated Central Artery  
*Courtesy of the Massachusetts Turnpike Authority (www.masspike.com).*

<sup>1</sup> “Project Updates.” *Massachusetts Turnpike Authority*. Available at <http://www.massturnpike.com/bigdig/updates/index.html>. Accessed March 7, 2007.

<sup>2</sup> “Project Background.” *Massachusetts Transit Authority*. Available at <http://www.massturnpike.com/bigdig/background/index.html>. Accessed March 7, 2007.

<sup>3</sup> T. Palmer, “Greenway Board wants horticultural society out.” *The Boston Globe*, 19 Oct 2006, C5.

**Figure 2a.** Before the Greenway



**Figure 2b.** Vision of the Greenway during the Day



**Figure 2c.** Vision of the Greenway at Night

*All Courtesy of the Massachusetts Turnpike Authority*

**Figure 3.** The Greenway Conservancy’s Vision  
*Courtesy of the Boston Foundation*

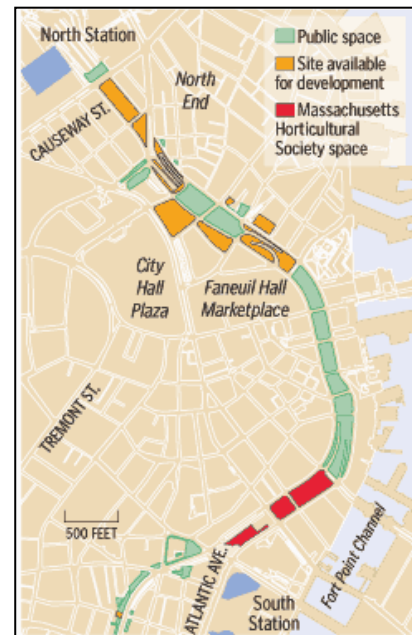


The Rose Fitzgerald Kennedy Greenway Conservancy was established to oversee the fundraising, operation, planning, and maintenance of the Greenway.<sup>4</sup> As community groups and government officials grew eager to see development begin, the Conservancy enlisted numerous local designers to provide conceptualizations of a central promenade complete with parks, gardens, and fountains, as well as cultural facilities, an outdoor cafe, and areas for large-scale events (See Figure 3). The Conservancy was tasked with raising \$20 million by the end of 2007, with the MTA promising to provide up to \$5 million to match all private-sector

donations dollar-for-dollar during 2004 and 2005.<sup>5</sup>

### ***The Massachusetts Horticultural Society***

One of the key stakeholders in the Greenway is the Massachusetts Horticultural Society (MassHort), which was designated to develop 2.5 acres (Parcels 19, 21, and 22) of the Greenway (See Figure 4). MassHort is the oldest formally organized horticultural institution in the United States and is a fitting partner for the Greenway. Founded in 1829, the organization has worked for nearly two centuries toward its mission of “encouraging and improving the science and practice of horticulture and developing the public's enjoyment, appreciation, and understanding of plants and the environment.” MassHort has championed many agricultural causes, such as the school garden movement of the 1880s and the Victory Garden movement of the 1940s. In fact, MassHort was instrumental in persuading the City of Boston to turn vacant lots and sections of city park space into Victory Gardens throughout the city. This project facilitated the emergence of the Boston urban gardening movement. MassHort also established the first 4-H group within Boston city limits.<sup>6</sup> Considering the organization’s historic involvement in urban agriculture, it is not surprising that MassHort is interested in featuring a food garden on one of the Greenway parcels.



**Figure 4.** MassHort-Designated Parcels in red  
*Courtesy of The Boston Globe*

<sup>4</sup> See [www.rosekennedygreenway.org](http://www.rosekennedygreenway.org).

<sup>5</sup> “Board members chosen for Rose Fitzgerald Kennedy Greenway Conservancy.” Boston Redevelopment Authority. Available at <http://www.cityofboston.gov/bra/press/PressDisplay.asp?pressID=250>. Last updated November 30, 2004. Accessed March 15, 2007.

<sup>6</sup> “History of the Massachusetts Horticultural Society.” Available at [www.masshort.org](http://www.masshort.org). Accessed March 16, 2007.

## ***Demonstration Garden Site***

Parcels 19, 21, and 22 of the Greenway have been designated for development by MassHort. These parcels lie in the heart of Boston’s financial district—situated among Boston’s tallest skyscrapers. This area is bustling with pedestrian and automobile traffic. The tip of Parcel 22, the southern-most parcel, lies just feet from Dewey Square and the entrance to South Station, a major public transportation hub in Boston. Thousands of people will be crossing these parcels each day en route to their various destinations. Thousands of vehicles also will pass by these parcels daily as they travel along Atlantic Avenue and Purchase Street, the two multilane avenues bordering the Greenway.

Though their plans have not yet been finalized, MassHort expects to create open park space on all three parcels initially and to construct a multi-function building on Parcel 22 in a later phase of development. MassHort has been working with Halvorson Design<sup>7</sup>, a renowned Boston-based landscape design firm, to sketch different possibilities for its parcels (see Figure 5). The demonstration food garden is most likely to be placed on Parcel 21, which is just over a third of an acre in size. While MassHort has not determined how much of the parcel to dedicate to a demonstration food garden, it will realistically be no larger than a quarter of an acre. Aside from other factors, the size of the garden is limited by the amount of sunlight that reaches the parcel. Only three-quarters of the parcel (~ 0.25 acres) receives six or more hours of sunlight daily from late April to late August, which is the minimum length of daylight needed to support most of the plants that would likely be grown (see appendix A for the sunlight study).

**Figure 5.** An example vision for parcels 19, 21, 22  
*Courtesy of Halvorson Design*



<sup>7</sup> See <http://www.halvorsondesign.com/>.



## ***Why a Demonstration Food Garden?***

Americans have become more and more disconnected from how and where their food is produced. At the same time, the quality of the typical American diet has declined. Obesity, diabetes, and other diet-related diseases are on a rapid rise, especially among children.<sup>8</sup> In response to the poor-quality processed foods offered by markets, there has been a revolt—a burgeoning movement of people re-forging connections with food and the land on which it's grown. This movement has taken particular hold in cities, where communities have banded together to start farmers' markets or shared gardens where they can grow their own safe, fresh, nutritious food.

It is not just the nutritional consequences of our modern food system that need to be addressed, but the environmental consequences as well. The modern U.S. food system has succeeded in producing massive quantities of commoditized food, but it has done so at a cost. We have paid for it with decreases in both agricultural and wild biodiversity—the rich variety of plants and animals that form our ecosystems and have co-evolved with humans—and with streams and harbors polluted by chemical run-off. Most importantly, this system is heavily dependent upon fossil fuels from production to consumption and as such contributes to global warming. Approximately 20 percent of the energy embedded in the current food system is used either in the production of fertilizers or on the field to run machinery. Off the farm, 35 percent of the energy used to get the average product to consumers goes toward transportation, processing, and packaging.<sup>9</sup> Such dependence on industrial inputs is unsustainable.

In light of statistics like these, the last few decades have seen an explosion in research, publications, and advocacy organizations devoted to making agriculture more environmentally and economically sustainable and supportive of small-scale family farms. The urban agriculture movement is a part of this overall rebuttal to industrial agriculture. Urban agriculture encourages food production at the local level in the form of inner-city farms and community gardens. Those committed to local urban agriculture feel that growing food in an urban setting has a number of positive impacts. It reconnects the city dweller with food production and the natural environment. It empowers and educates those interested in self-sufficiency. It also contributes to good eating habits and nutrition education—especially crucial at a time when more children than ever before are overweight and obese. Local food production improves local food security. Lastly, local gardens beautify their location with vital green space, often a much-needed oasis in the steel and concrete of an urban location.

The urban agriculture movement has been embraced by dedicated individuals working to reform school lunch offerings by reconnecting students to food production. The Edible Schoolyard in Berkeley, begun by chef Alice Waters, has become the model for radical reform of school lunch programs and of science curricula. Children grow, prepare, and eat the food from their school's garden, all the while learning about biology, chemistry, and history.<sup>10</sup> Similarly,

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<sup>8</sup> Flegal, K., M. Carroll, et al. (2002). "Prevalence and Trends in Obesity among US Adults, 1999-2000." *Journal of the American Medical Association*. 288:1723-1727.

<sup>9</sup> Center for Sustainable Systems. (2005). "U.S. food system factsheets from the University of Michigan." Available at [http://css.snre.umich.edu/css\\_doc/CSS01-06.pdf](http://css.snre.umich.edu/css_doc/CSS01-06.pdf). Accessed March 16, 2007.

<sup>10</sup> See [www.edibleschoolyard.org](http://www.edibleschoolyard.org)

The Center for Ecoliteracy has created the “Rethinking School Lunch” program, which uses a systemic approach to address the interrelated problems of childhood obesity, lack of nutrition education, and lack of natural science knowledge.<sup>11</sup> At the Friedman School at Tufts University, Michelle Markesteijn-Ratcliffe has demonstrated ways in which garden-based learning increases children’s willingness to try and consume vegetables.<sup>12</sup> The Friedman School is also piloting a rooftop garden learning project at the Josiah Quincy Middle School in the heart of Chinatown. Somerville schools have realized the benefits of connecting children with food production and have created their own garden-based learning curricula.<sup>13</sup> Even colleges and universities are exploring the benefits of local food production. Yale, Harvard, Williams, and Tufts are just some of the institutions of higher learning in which administrators and students are working to source food locally, and in some cases, grow food on campus.<sup>14</sup>

As of 2002, over 175 organized community gardens were spread throughout different Boston communities, with the largest numbers concentrated in Dorchester, Roxbury, Jamaica Plain, and the South End.<sup>15</sup> A demonstration food garden on the Greenway would build on an already thriving local garden scene and would serve as an educational and experiential resource for those gardening in the greater Boston community. Urban gardening is not a passing trend; it is a social phenomenon that has sprung up in response to concern about the problems with our current industrialized food system. Boston can be an active participant in this movement to make our cities healthier and our communities more connected. A demonstration garden on the Greenway would be a true common ground for our community.

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<sup>11</sup> “Rethinking school lunch.” *The Center for Ecoliteracy*. Available at <http://www.ecoliteracy.org/programs/rs1.html>. Accessed March 16, 2007.

<sup>12</sup> Markesteijn-Ratcliffe, Michelle. (2006) *Garden-Based Learning in School Settings: The Effects on Children’s Vegetable Consumption, Vegetable Preferences and Ecoliteracy, and the Development of a Conceptual Framework*. Unpublished Dissertation, Tufts University’s Friedman School of Nutrition Science and Policy. Boston, MA.

<sup>13</sup> Groundwork Somerville, <http://www.groundworksomerville.org/brownschool.html>

<sup>14</sup> See Harvard’s Food Literacy Project at <http://www.dining.harvard.edu/flp/index.html>; Yale’s Sustainable Food Project at <http://www.yale.edu/sustainablefood/farm.html>; and Tufts FEAST at <http://www.tufts.edu/programs/feast/>.

<sup>15</sup> “Community gardens in Boston.” Boston Natural Areas Network. Available at <http://www.tbf.org/indicators2004/environment/indicators.asp?id=2298&crosscutID=323&crosscutName=Boston%20Neighborhoods>. Accessed March 16, 2007.

### III. Garden Themes

A thematic approach to a demonstration garden is recommended to provide coherence and focus for garden design and programming. A well-developed theme could guide the implementation and operation of the Greenway garden, from public relations and outreach to the optimal selection of plant varieties for a limited space. After considering many possible themes, we selected three for further development:

- **Healthy Eating in the American Garden**
- **Boston's History through Food and Agriculture**
- **The World Garden: Highlighting Boston's Diversity**

In selection of our three themes, we took into account the area surrounding Parcel 21 of the Greenway, area foot traffic, nearby businesses, and transportation infrastructure. Also considered was Boston's layout, including its "walkability," its history as a city, and its major attractions to tourists. Development of each theme included identification of target audiences, benefits to visitors and to the general community, appropriate plantings, and programming possibilities specific to that theme. We believe the three chosen themes, described later in this report, have the most flexibility, the widest appeal, and the greatest number of opportunities for public education and enjoyment. Yet, these themes are by no means the only viable options for a demonstration garden. Below is a short list of other themes highly ranked and which may also generate community enthusiasm. In all cases, these themes could encompass ample educational and recreational opportunities.

- *Environmental Awareness Garden*: Educating the public on environmental concerns
- *Food Security Garden*: Highlighting issues of Hunger and access to food in the U.S.
- *The Herb and Salad Garden*: Supplying a nearby café with salad ingredients
- *Science in the Garden*: Demonstrating chemistry, zoology, and ecology in the garden

Regardless of the particular theme employed, a suite of educational and celebratory programming could involve diverse members of the community in garden activities. Such programming could include science lessons in chemistry, botany, and other subjects, cooking demonstrations, harvest festivals, and explorations of history and culture through food.

## ***Theme: Healthy Eating in the American Garden***

The foundation of this garden concept is nutrition education. It is a response to the steep upward trends in overweight and obesity in this country. Diet-related health problems like diabetes and heart disease are afflicting an increasing number of Americans. The Centers for Disease Control publish data that describes the extent of the problem in our state. In 2004:

- 55% of Massachusetts adults were overweight or obese
- 24% of Massachusetts high school students were overweight or at risk of becoming overweight<sup>16</sup>

Most Americans are aware that their eating habits affect their health but may not necessarily know how to change these habits for the better without feeling deprived. A demonstration garden designed around a health and nutrition theme could make learning fun and interactive for children and adults. Garden-based learning that incorporates nutrition has proven very successful nationwide. Alice Water's Edible Schoolyard has proven that children really respond to involvement in gardening and are more likely to try fruits and vegetables that they have contributed to growing.<sup>17</sup>

This garden would focus on the familiar. It would contain America's most popular fruits and vegetables, as appropriate for the climate, and would provide information to visitors about healthful and tasty ways to prepare them. In addition to disseminating nutritional information, the garden would aim to reconnect people with food production. Many of us only see our vegetables in supermarket displays or on our plates, but not rooted in the ground. Materials and plaques could display facts on the origin and development of various fruit and vegetable plants. Heirloom varieties could be planted alongside their more common hybrid relatives to demonstrate the variety that nature offers. Less commonly consumed vegetables, particularly leafy greens, could be highlighted in the garden to expose visitors to new and interesting ingredients with high nutritional value. Garden information could also direct visitors to the network of farmers markets that are becoming increasingly popular in Boston, including the emerging Boston Public Market that will be within sight of the garden.

A secondary aim of this garden would be the promotion of activity. An active lifestyle and a proper diet are equally important in maintaining health. Plaques might display the number of calories burned during different gardening activities or how many steps around the garden it might take to burn off the calories in a single raspberry. A variety of programming would create different types of experiences for visitors depending on their needs and interests.



*Courtesy of <http://watchwithmothers.wordpress.com>*

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<sup>16</sup> Centers for Disease Control, Behavioral Risk Factor Surveillance System, 2004 Survey Data; Accessed at <[http://www.cdc.gov/brfss/technical\\_infodata/surveydata/2004.htm](http://www.cdc.gov/brfss/technical_infodata/surveydata/2004.htm)>

<sup>17</sup> "Education for Sustainability: Findings from the Evaluation Study of the Edible Schoolyard", The Center for Ecoliteracy, April 2003, Accessed at: <<http://www.ecoliteracy.org/publications/pdf/ESYFindings-DrMurphy.pdf>>

## Programming Recommendations

- Develop garden-based nutrition classes for visiting adults and children, possibly with a companion classroom lesson to be completed before or after their visit.
- Accompany each fruit or vegetable growing in the garden with a plaque reporting its nutritional value and describing its history.
- Create displays that compare the nutritional content of two dishes featuring the same vegetable or fruit (i.e. French fries vs. roasted potatoes; iceberg lettuce salad vs. spinach salad; strawberry jam vs. fresh strawberries).
- Organize cooking demonstrations by local or visiting chefs using garden ingredients.
- Provide sample daily menus—with recipes on take away cards—that meet daily USDA dietary recommendations. Make these available in a permanent kiosk.
- Complement the garden with a website that contains basic nutrition information, recipes, and helpful links.



*Courtesy of the  
Agricultural Research  
Service of the US  
Department of Agriculture  
([www.ars.usda.gov](http://www.ars.usda.gov))*

### **Planting Recommendations**

#### *Vegetables*

- Beets
- Broccoli
- Cauliflower
- Carrots
- Collards
- Corn
- Cucumbers
- Green beans
- Kale
- Lettuce
- Peppers
- Potatoes
- Snap peas
- Spinach
- Squash
- Tomatoes
- Zucchini

#### *Fruit*

- Apples
- Blueberries
- Cantaloupe
- Grapes
- Peaches
- Pears
- Raspberries
- Strawberries
- Watermelon

## ***Theme: Boston's History through Food and Agriculture***

As one of the oldest cities in the U.S., Boston is a major tourist destination. From the region's many native peoples to the English settlers who arrived in 1620, seeking religious freedom from England, we are at the epicenter of American history. The proximity of the Greenway to Boston's famous Freedom Trail, offers an opportunity to explore Boston's history through a food garden planted with fruits and vegetables eaten by our city's first inhabitants. In this garden, visitors would see both familiar plants like beans, squash, and onions and less familiar ones utilized by the native people, like fiddlehead ferns, salsify, and hazelnuts. Plantings would be primarily native to the region or important historically.



Squaw Sachem, leader of the  
Massachusetts  
Source: [www.menotomyjournal.com/massachusetts](http://www.menotomyjournal.com/massachusetts)

Our state is named for the Massachuset Tribe, whose territory stretched from modern Salem in the north to beyond modern Brockton in the south. Sadly, the Massachuset fell victim to epidemics brought by the settlers from the Old World, and none remain today. But they have much to teach about the rich and varied food resources of the area and about their agricultural traditions, which were a salvation to the newly arrived Pilgrims.<sup>18</sup> Native people cultivated the now famous triad of crops – maize, beans, and squash – in a unique and ingenious way. Three to five corn kernels were sown in a hill of earth along with a fish, which would decompose and provide nutrients to the growing plants. Three or four beans were planted around the corn hills so the growing bean plants would climb the stalks and add support as they both matured. Squash and pumpkin seeds were planted in the areas between the corn and bean hills, suppressing weeds and preventing erosion. This sophisticated technique is a lesson in symbiosis and maximization of available resources.

The English settlers brought seeds or rootstock from many common European crops to Massachusetts. Included were apples, turnips, carrots, barley, oats, wheat, and cabbage. They adapted to the new environment with varying success. Apple trees thrived in the soils and climate of the Northeast; wheat took many years to recover from devastating blight. These crops, along with the maize introduced to them by the Native Americans, and the domestic animals they brought by ship from England, formed the bulk of their diet.<sup>19</sup> Over the past 200 years, many fruits, some of them now famous, were bred in Massachusetts: the Bartlett pear, the Concord grape, and the Roxbury Russet Apple. MassHort, established in 1829, was active in this development. This garden would highlight the history and evolution of our region's agricultural and culinary traditions, creating a food timeline of Boston's history.

<sup>18</sup> "Eating in America: A History" Waverley Root and Richard de Rochemont, The Ecco Press, New York 1976.

<sup>19</sup> "Seventeenth-Century English Yeoman Foodways at Plimouth Plantation," *Foodways in the Northeast: The Dublin Seminar for New England Folklife*, James Baker, The Trustees of Boston University 1984.

Programming Recommendations

- The garden would highlight the evolution of American food production techniques over the centuries.
- Displays would highlight fun facts about food: Boston’s molasses flood of 1919, the history of baked beans, and the clambake.
- The now quintessential American holiday, Thanksgiving, would be celebrated in a late fall harvest festival at the garden. Contributions from both the Pilgrims – apples, cabbage, wheat – and the Native Americans – cranberry, maize, pumpkin, and maple syrup – would be harvested and/or prepared for the celebration.
- The garden could be linked to the Freedom Trail to bring visitors to the site of the Boston Tea Party, which occurred where Parcel 21 now sits.<sup>20</sup>



Fiddlehead Fern  
 Courtesy of  
[www.winemaking.jackheller.net](http://www.winemaking.jackheller.net)

- A companion “Food Trail” could be developed that might include stops in Boston neighborhoods famous for their cuisine (i.e. Chinatown and the North End), historic Boston restaurants like the Union Oyster House, and greenmarkets like Haymarket and the proposed Boston Public Market on the Greenway.
- Educational opportunities in the areas of science, history, and anthropology would draw visiting school groups.

<b><u>Planting Recommendations</u></b>	
<i>Vegetables/Nuts</i>	<i>Fruit</i>
<ul style="list-style-type: none"> <li>• Carrots</li> <li>• Fiddlehead Ferns</li> <li>• Hazelnut</li> <li>• Jacob’s Cattle Beans</li> <li>• Jerusalem Artichokes</li> <li>• Leeks</li> <li>• Maize</li> <li>• Maple</li> <li>• Mayflower Bean</li> <li>• Nasturtium</li> <li>• Pumpkins</li> <li>• Salsify</li> <li>• Sassafras</li> <li>• Scarlet sumac</li> <li>• Sunflowers</li> <li>• Sweet Potatoes</li> <li>• Walnuts</li> <li>• Wheat</li> </ul>	<ul style="list-style-type: none"> <li>• Bartlett Pear</li> <li>• Beachplum</li> <li>• Blueberries</li> <li>• Concord Grape</li> <li>• Roxbury Russet Apple</li> <li>• Strawberries</li> </ul>

<sup>20</sup> This section of the Greenway was once a part of the bay which has since been filled.

## ***Theme: The World Garden: Highlighting Boston's Diversity***

Boston, like all of the U.S., has been shaped by immigrants from all over the world. In Massachusetts, one in seven residents was born in another country.<sup>21</sup> The state has experienced multiple waves of immigration, from the early colonists to later waves of Irish and Italian immigrants. Today, nearly half of Boston's recent immigrants have come from Latin America, a quarter from Asia, seventeen percent from Europe, and nine percent from Africa.<sup>22</sup> These diverse populations bring an equally diverse set of culinary experiences, and many of the people come with farming experience. The 2002 U.S. Census of Agriculture shows immigrant farmers to be the fastest growing group of farmers in the nation.<sup>23</sup>



Khmer farmer harvesting mustard greens in Dracut, MA  
*Courtesy of the New Entry Sustainable Farming Project*

In the Boston area, the New Entry Sustainable Farming Project (NESFP) assists immigrants with agricultural experience to apply their skills in their new environment and become commercial farmers. Currently the project supports 50 farmers of Southeast Asian (specifically Hmong and Khmer), West African and Latino origins. The NESFP not only benefits the immigrants directly involved in the project but it also benefits the greater immigrant population by creating a local, fresh supply of the fruits and vegetables that are an important part of their culture.

The proposed demonstration garden on Parcel 21 offers the opportunity to feature cultures through crops, highlighting different foods eaten around the world and, increasingly, here at home. This garden theme would aim to expose visitors to the unfamiliar. People strolling by might be drawn in by the sight of a bitter melon growing up a trellis, or peanuts being pulled from the ground. There is no better way to connect with another culture than by sharing food traditions.

### Programming recommendations

- A community cultural organization could “adopt” the garden every year, choosing crops specific to their region of the world and designing special activities to share the culture of that region more broadly. Decorations and activities would all revolve around this cultural theme.
- A summer festival, where residents and visitors join together to celebrate the year's featured culture could be held. Musicians would play while participants learn ethnic

<sup>21</sup> “The Changing Face of Massachusetts”, MassINC (Massachusetts Institute for a New Commonwealth) and the Center for Labor Market Studies, June 2005.

<sup>22</sup> MassINC, Available at: [http://www.massinc.org/index.php?id=375&town\\_id=36&OrderBy=rank](http://www.massinc.org/index.php?id=375&town_id=36&OrderBy=rank)

<sup>23</sup> USDA Census of Agriculture, Available at: [http://www.nass.usda.gov/Census\\_of\\_Agriculture/index.asp](http://www.nass.usda.gov/Census_of_Agriculture/index.asp)



dances. Vendors would sell interesting foods from the region, so participants can taste new cuisines while learning how to grow the ingredients.

- Office workers could sit out on benches in the sun, trying samples of unique produce, like bitter melon and pumpkin blossoms, prepared during cooking demonstrations.
- School children could visit the garden for field trips and day camps. While they're getting their hands dirty, they're learning about another culture and about good nutrition all at the same time.
- An art festival featuring immigrant art throughout the garden would offer immigrant artists an opportunity to sell their wares and add beauty to the space.
- Local farmers sell produce during special events at the garden, so customers can go home and try preparing what they saw growing at the garden.
- Links could be made to ethnic restaurants in Boston that coincide with the region of the world under study.



Bitter Melon  
 Courtesy of [www.digi-affiliate.com/japan](http://www.digi-affiliate.com/japan)

<b><u>Planting Recommendations</u></b>	
<i>Vegetables</i>	
<ul style="list-style-type: none"> <li>• Amaranth</li> <li>• Asian Pumpkin</li> <li>• Bitter Melon</li> <li>• Bokchoy</li> <li>• Chili Peppers</li> <li>• Chinese Broccoli</li> <li>• Cilantro</li> <li>• Japanese Eggplant</li> <li>• Lemongrass</li> <li>• Long Beans</li> <li>• Mo-ming</li> <li>• Mustard Greens</li> <li>• Papalo</li> </ul>	<ul style="list-style-type: none"> <li>• Pea Tendrils</li> <li>• Peanuts</li> <li>• Pipicha</li> <li>• Purple Taro</li> <li>• Squash Blossoms</li> <li>• Thai Basil</li> <li>• Tomatillo</li> <li>• Water Spinach</li> </ul>
	<i>Fruit</i>
	<ul style="list-style-type: none"> <li>• Asian Pear</li> <li>• Pawpaws</li> <li>• Hearty Kiwi</li> </ul>

## IV. Survey Research

### *Overview*

As we began our project, we found ourselves asking numerous questions about the feasibility and design of a demonstration food garden. Should we be worried about ambient pollutants affecting the edibility of the food produced on the Greenway? How might a garden space maintain its beauty and utility in the middle of a Boston winter? Should we keep compost on site and, if so, would it create pest problems? We recognized that our many questions were not unique to a food garden on the Greenway and that there were likely colleagues in the urban gardening field from whose wisdom we could benefit. Thus, to provide the best possible set of recommendations for the planning, establishment, and operation of a demonstration food garden on the Greenway, we surveyed the managers or head growers of 25 major urban farms/gardens in the U.S. and Canada. (See appendix B for a listing of organizations surveyed) Our survey collected experiences and perspectives on common problems surrounding urban vegetable production.<sup>24</sup> (See appendix C for the interview protocol used and appendix D for the survey questionnaire).

Survey participants were chosen non-randomly. We identified existing urban gardens within the continental United States and Canada using various internet search engines, outreach on the Community Food Security Coalition List Serve, which is managed by Tufts University staff, and the information provided on the “links” page of the American Community Gardening Association website.<sup>25</sup> We initially identified 78 target gardens/organizations. Those gardens with operational websites tended to provide the most up to date contact information and were therefore more likely to be chosen as potential survey participants. While we aimed for a broad survey of varied gardens, we gave preference to gardens/farms situated in climates and surroundings similar to those of Boston’s Greenway. We reasoned that managers of these gardens could offer knowledge more appropriate for the design of a garden in a heavily developed, high-traffic area of the temperate northeastern U.S.

The 78 target organizations were divided into rough quarters by geographic area, and each interviewer was assigned a list to survey. Additional online research was often required to find current contact information for the gardens/organizations we identified preliminarily. In many cases, interviewers discovered that a garden/organization on their list was either no longer in operation (e.g. *South Central Farmers* of Los Angeles, who were in the process of being evicted from their land) or was not a functioning garden (e.g. the *Common Ground Garden Program* at U.C. Davis). In some cases, interviewers were referred by interviewees to other potential participants, or otherwise discovered and added a new organization to their list. For these reasons, the target sample was somewhat fluid during the survey process.

Data was collected via one-on-one, one-time telephone interviews. We contacted potential participants by phone or email, attempting contact with a particular organization no more than three times. If no one answered a particular call, we left a brief explanatory voice

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<sup>24</sup> Our survey was approved for exemption by the Institutional Review Board of Tufts University.

<sup>25</sup> <http://www.communitygarden.org/links.php#Gardens>.

message and a telephone number for replies. If no contact was made by the third attempt, we struck the organization from the participant list. If an identified farmer/gardener did not wish to participate in the survey, we struck the organization from the participant list. If at any time the interviewee wished to terminate the interview, he or she had the right to do so, and we struck the organization from the participant list.

We ultimately conducted 25 complete surveys. We recorded responses by hand during interviews in either typed or written notes. We then compiled notes in individual Word documents by organization. Each file was assigned a number, and the responses were separated by issue area, with only the number identifying each comment. Each of the team members analyzed, both quantitatively and qualitatively, the responses to questions on a group of six survey “issues” (e.g. ambient pollution, theft and vandalism). Two people analyzed each group of responses to minimize error in analysis. We identified relevant trends in the data and identified recommendations and anecdotes from each issue area.

## ***Findings and Recommendations***

### **1. Audience**

A wide variety of populations will cross paths in the garden. Several office buildings surround the garden plot, and condominium buildings are nearby as well. Chinatown is only a few blocks away. Tourists visit Boston for all sorts of activities. Every day, many commuters and long-distance travelers come through South Station, located just steps away from the garden. There are plenty of potential visitors. The question is how to draw them to the garden.

#### Findings

The community gardens in our study were most frequently visited by members who tended their own plots and by some community residents. Gardens in public parks drew more visitors due to their location. To draw in visitors, gardeners used a variety of community outreach tools. Several gardens put up signs both identifying the garden and for educational purposes, some in multiple languages. Gardeners often built their programming around youth activities and school field trips, but they also created events for the adult community (i.e. harvest festivals, movie nights, art shows, potlucks, etc). In multiple interviews, we were told that when someone gets his/her hands dirty in the garden, s/he feels a connection to it. Some gardeners stated that simply a few pleasant benches could draw in visitors. According to one, “people are willing to...walk some place if they know there’s a place to sit.” Two gardens were built to ensure access for people with disabilities.

In addition to holding events at the gardens, gardeners advertised in media. While some used word of mouth, others went further to advertise in newspapers, coffee shops, and on Craig’s List.<sup>26</sup> A few gardens had websites of their own, depending on available resources or volunteer skill. One gardener expressed the importance not just of reaching out to people, but going to where they are. She specifically said that setting up meetings for others to attend never worked as well as attending others’ meetings and inviting them to be a part of the design process and making of a garden.

#### Recommendations

The gardeners in our study offered many suggestions for making the garden welcoming. Many people will pass by the garden as a part of their daily commute or lunch hour, so the garden should have inviting places to sit. Organizing a variety of events and programming will draw a wider audience from the broader community. Further, the garden’s signs should use multiple languages. Given the size of the Hispanic population in Boston and the close proximity of Chinatown, Spanish and Chinese would be appropriate languages. The garden should also meet the standards of the Americans with Disabilities Act, so that those with physical handicaps may enjoy the space as well.

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<sup>26</sup> Craig’s List is network of websites for cities that hosts free advertisements for jobs, services, and housing as well as free/sale/barter/wanted advertisements ([www.craigslist.org](http://www.craigslist.org)).

Organizers will need to be creative in choosing outlets for advertising. Certainly, the garden should be advertised as part of the larger Greenway effort. The garden staff and volunteers should visit local offices and community groups both to welcome input and, later, to involve them in activities in the garden. The demonstration garden itself should have its own page on the Greenway website to list activities and programming.

## 2. Planting Choices

Selecting food plants to be grown requires consideration of multiple factors. Which plants are suited to this climate? Will certain plants out-compete others for sunlight and nutrients? What plants will most intrigue visitors? We asked garden managers about the choices they made for their gardens and discovered some interesting possibilities for the Greenway demonstration garden.

### Findings

In the survey, managers were asked about how they mixed perennials into their garden space. We found that close to 50% had fruit trees. The most popular species were apple, peach, and cherry. Crabapples, apricot, pear, and plum trees were also planted by a handful of gardeners. One manager told us that he preferred the Asian pear tree because it is fairly resistant to pests. Not all gardens had success with fruit trees or chose to plant them, however. Two managers gave up on planting fruit trees—one because they required too much maintenance and the other simply because the trees had failed to thrive. In urban settings, the soil is often not deep enough or is too compacted to support the root structure of trees. Because each urban garden site is different, gardeners will have varying degrees of success with cultivating trees. Three gardens did not allow people to plant trees because they can shade out the vegetable plots and create too much competition for water and soil nutrients. Of the gardens surveyed, a quarter planted fruiting bushes (i.e. raspberries, blackberries, blueberries, gooseberries) to add variety and to attract visitors to the garden, and 16% had fruiting vines. Grapes were the most popular vine fruit, but one garden in the Northeast had a kiwi vine growing along its waterfall installation. Some gardens incorporated perennial vegetables into their garden, such as rhubarb, Jerusalem artichokes, and asparagus. Other gardeners also liked to incorporate non-food producing perennials that attract beneficial insects along the garden borders.

We asked managers if they incorporated native or exotic food crops into their mix and if they have successfully used any interesting space-saving techniques in their gardens. Of those surveyed, 20% stated that they or members of their garden have planted native species. One garden had an entire bed dedicated to growing native species. About 10% of managers stated that they or members of their garden have planted African, Asian, and South American crops. Of course, since there were a lot of community gardens in our survey, these numbers might be higher, as the managers may not necessarily be aware of all that is being grown in the individual plots. We heard about several creative vertical growing techniques that people are using to maximize space in their gardens: growing beans up cornstalks and teepees rather than a trellis, using wall hangs for growing plants, and building cages for squash plants to climb. One individual grew pumpkin vines up a two square foot cage using wooden supports to hold the pumpkins. He was able to grow three pumpkins in this space, whereas it normally could takes 5-10 square feet to grow three pumpkins.

## Recommendations

While trees can be tricky to grow in urban settings, they can certainly thrive if they receive proper care. From our survey, it was reported that apple, pear and stone fruit trees can grow well in urban settings. We have no doubt that MassHort has the expertise to successfully cultivate fruit trees and we recommend that they be incorporated into the demonstration garden area if it is logistically feasible. Of course, the trees should be placed with care to prevent the vegetable beds from being shaded by the tree canopy. Also, pest-resistant varieties should be selected. Fruiting bushes and vines should also be grown in the garden (this is also discussed in the Fencing and Buffer section) as visitors seem to really enjoy them. We recommend that other perennial food plants and herbs (i.e. asparagus, rhubarb, mint, chives, etc) be included in the garden as they can be used in educational programming to teach people about plant lifecycles and they require very little labor to maintain. Asparagus is quite an incredible looking perennial and might help draw attention to the garden space. Finally, we recommend that the garden include demonstrations for growing plants vertically. The previously mentioned examples are certainly great ideas to replicate. Gardeners will enjoy learning about these techniques, and visitors in general will be entertained by the creativity and novelty of it.



Bean Teepees

*Courtesy of Culiblog at [www.culiblog.org](http://www.culiblog.org)*

### 3. Winter Aesthetics

Urban food gardens can create a much-appreciated visual contrast to the hardscape of an inner-city. During the cold winter months of the Northeast, however, the summer beauty of most food crops will be lost. Foot traffic through the area of the demonstration garden, on the other hand, will be steady throughout the seasons. Thus, it is very important for this garden to be aesthetically pleasing throughout the year. We used our survey to gather ideas and information from garden managers about how we can accomplish this goal.

#### Findings

Less than a third of the managers we interviewed felt that the winter appearance of their garden was a major priority for their organization. Some of our interviewees are simply blessed with a year-round growing season, so they continue to cultivate their gardens through the winter. For others, it seemed that the issue didn't have a high priority because managers were restricted by limited funding. Most of the managers we interviewed oversaw community gardens, which are member-led organizations. In community gardens, members are generally responsible for supplying the labor and funding to maintain their individual plots and the common areas in the garden. Coming up with additional funding and labor to maintain an aesthetically pleasing garden year-round may often be beyond that which the members can expend.

Those who do prioritize winter aesthetics used a variety of methods to bring life to their garden area in the winter. Most of the organizations planted perennial plants, including evergreens, throughout their space to keep it looking green year round. See the "Planting Choices" section above for more on perennials. Community gardens generally require individual members to follow specific clean-up rules to prevent the garden from "looking abandoned." Some offer free cover crop seeds for members to plant on their plots. Cover crops provide protection for the soil and can add a decorative element to the garden. Of those surveyed, 28% had part or all of their garden beds seeded with cover crops. The most popular cover crop used was rye, but some gardeners used clover and fava beans.<sup>27</sup> One manager emphasized the importance of sowing the cover crop by late October to ensure that the crop has enough time to establish itself before it gets too cold. Mulch was used by members in a third of the organizations to cover their garden beds in the wintertime. In 24% of the organizations, we found that some members used a season-extending growing technique. Cold frames<sup>28</sup> and greenhouses are most commonly used, but plastic row covers were also



Cold frames

*Courtesy of the Slowgardening Blog at [www.slowgardening.com](http://www.slowgardening.com)*

<sup>27</sup> The fava beans were used as a cover crop in California and would not be well suited as a cover crop in Massachusetts.

<sup>28</sup> Cold frames are essentially very small greenhouses. They can be used to continue growing crops past the normal growing season or to start plants earlier in the spring.



employed to protect crops from frosts in the spring and fall. One person we spoke with is able to grow various crops year round by using cold frames and micro-greenhouses. Finally, gardeners have created sculpture gardens and have also used lighting creatively to help beautify the garden during the winter months.

### Recommendations

While some may find the task of creating beauty in a New England food garden during the winter daunting, we were excited to explore the possibilities and to offer recommendations in this area. First and foremost, we recommend that the site be tied into the surrounding park space with landscaping that incorporates cold-tolerant, perennial, evergreen plants. Evergreens will keep the area green in the winter and will reduce labor costs related to annual transplanting. We recommend seeking MassHort recommendations on choosing perennial varieties, but as a start, planners should consider varieties that will bloom and then produce berries between the late fall and early spring (i.e. *Skimmia* (*Skimmia japonica*), Wintergreen (*Gaultheria Procumbens*), and Winter Akinite (*Eranthis hyemalis*)).

Moving from the surrounding area to the food garden beds themselves, we recommend the use of cover crops and season extension techniques as a way to keep the garden visually appealing and productive as well as a way to create possibilities for educational programming during the winter. One garden manager we interviewed proudly asserted that he could “walk into the garden any day of the year and teach something.” Community gardeners, home gardeners and other visitors would enjoy learning about improving soil health with the use of cover crops and winter growing with the use of cold frames and other season extension techniques. Also, some plants could be allowed to go to seed so that programming around seed saving could be developed. We understand that years from now, planners envision an extensive “winter garden under glass.” In the meantime, cold frames could create small “winter food gardens under glass.” Cold frames themselves can be quite beautiful and could be crafted by local artisans that add their own flair to each piece. The work of local artisans could also be displayed in the winter by capping some of the food garden beds with platforms to hold sculptures. Finally, echoing the ideas of several of our interviewees, the creative use of lighting can add a special, striking element to the garden.

#### 4. Traffic and Visitor Safety

Parcel 21 is situated between two multilane, high-traffic avenues, Atlantic Avenue and Purchase Street. We are concerned about the safety of pedestrians crossing these avenues to reach the garden and also about the safety of families and their children who are playing within the garden area. If people do not feel safe in the area, they will be deterred from visiting the food garden as well as other nearby sections of the Greenway.



##### Findings

Out of the twenty-five gardeners interviewed, only two cited traffic as a safety concern in the area around their garden. As a result, we received less insight and advice on this issue than others. In general, our interviewees emphasized the importance of having clearly marked crosswalks to improve pedestrian safety. One gardening organization in a major city was able to improve the pedestrian environment near their garden by working with their City government. After members from the organization drew attention to the problem, the City put in new stop signs and crosswalks at intersections in the area.

##### Recommendations

The City of Boston and Massachusetts Turnpike Authority (MTA) have no doubt put much thought into pedestrian safety along the Greenway. However, if present plans for the area do not sufficiently address safety concerns for pedestrians, we advise planners involved in developing the Greenway to work with the City and MTA to make needed improvements.

Ideally, the demonstration food garden will be a place of learning for school children. To avoid unnecessary risks of having large groups of children crossing Atlantic Avenue or Purchase Street, we understand that the idea of a taxiing area for school buses to drop off children directly onto the parcel is under discussion. This is an idea we support. As well, the safety of the park and garden area can be enhanced by surrounding the perimeter with a fence to prevent children from running into traffic.

## 5. “Finger Blight,” Theft and Vandalism

Urban food gardens are more likely to experience acts of theft and vandalism than rural or suburban food gardens and farms. Naturally, we would want to ensure that the garden site was not subject to theft or vandalism. This goal should not, however, come at the cost of maintaining an inviting atmosphere. We would also want to minimize the amount that people harvest from the garden without permission, which we have termed “finger blight,” so that all visitors will have the chance to see the plants as they develop and grow to maturity.

### Findings

Urban gardeners tend to use fences as their first line of defense against vandalism and theft. Of those surveyed, 75% had fences around all of the gardens under their supervision. Of those with fences, a full 80% stated that they also lock their gardens during set hours or when the garden was without a key-holding member on the premises. About half of the respondents reported that their garden had suffered acts of theft and a third experienced some vandalism. However, the majority of these gardens experienced only minor acts of theft or vandalism. Only three gardens had a significant value of property stolen or destroyed, and just one garden manager reported a major act of vandalism. The general message we received from garden managers was that theft and vandalism can be expected as the garden is getting established but that it will become less frequent over time. Two managers who oversee multiple garden sites also told us that their more exposed, visible gardens have fewer problems with theft and vandalism.

We also heard from managers that community outreach is the key to minimizing theft and vandalism. By creating a sense of community ownership of the garden and by making the garden a community asset, managers have seen reduction in theft and vandalism over time. Educational and celebratory programs that invite community members into the garden space are valuable in forging such community connections. Two managers emphasized the importance of forgiveness in times when the garden is damaged by theft or vandalism. In one instance, an urban farm experienced an act of arson that destroyed its kitchen facilities. The organization reacted by involving one of the youth responsible in their growing operations. This individual has since become a protector of the garden, working to encourage other youth in the area to treat it with respect.

As was eloquently articulated by one manager, “communication can act as a fence in itself.” Communication can occur not only via direct interactions with community members but also through the use of signs. Some gardens have signs that explain the purpose and history of their garden. Others have signs that ask visitors to respect the efforts of those who have created the garden and not to harm the plants or the premises. Gardens sometimes post signs in various languages that reflect the diversity of the community. Signage seems to be the main tool used by gardeners to reduce “finger blight,” but some community garden managers have experimented with creating specific plots as “sharing” or “sample” plots from which visitors can pick, to discourage people from picking fruits and vegetables from remaining plots. Managers had other tidbits of advice on the subject of “finger blight” and vandalism. Two managers recommended

that the garden be well-lit at night to discourage trespassing and destructive behavior. One found it useful to give children permission to use cherries for playing and throwing to keep them away from tomato plants. Another discouraged break-ins by planting thorny rose bushes along the fence.

### Recommendations

From the responses we received to this section of our questionnaire, we do not believe it necessary to surround the demonstration garden with a tall, locked fence. Because the site is visible from surrounding areas, not enclosed by buildings or other structures, we anticipate that it will not experience high levels of destructive activity. The issue of fencing will be discussed in more depth in the next section. As we were advised to remember by our interviewees, fences can be climbed and “locks can be cut.” Thus, we recommend that planners use other tools to prevent theft and vandalism. First, emphasis should be placed on community outreach to foster a sense of ownership of the garden. Garden programming should be of educational benefit to the community and should be organized in such a way that it makes people feel that they have a stake in the success of the garden. Second, the garden should be well-lit at night to deter individuals from engaging in destructive activities. Third, signage should be used to communicate the purpose and rules of the garden and to inform visitors of upcoming garden programs. Fourth, as tools are often the target of theft in urban gardens, they may need to be stored off-site. Finally, to minimize “finger blight” in certain beds, visitors should be directed with signs to designated “sampling plots” from which they are allowed to pick if they are curious. Perhaps MassHort could grow plants offsite to restock the “sampling plots” as needed.

## 6. Pollutants

Food produced in contaminated soil can be detrimental to the health of those who consume it. Considering the location of Parcel 21, it will be necessary to develop a system for monitoring ambient pollutants and to employ production methods that minimize food safety risk. In our interviews, we asked gardeners about the types of pollution they experienced, how they monitor pollution levels, and remedies used when pollution is discovered in their gardens.

### Findings

We found that just over a half of the gardens in our survey had tested for soil contamination at least once. Of these, 20% were tested solely at the time of establishment, 12% are tested every few years, and 20% are tested annually. Two managers expressed that they did not have to worry about soil contamination due to their use of organic production methods (a misconception). Of those undertaking soil testing, 36% discovered soil contamination within their gardens. Out of this group, 77% found high levels of lead, 33% had high levels of arsenic, and one garden had high levels of barium in its soil.

Lead contamination is very common in urban soils. Though it was banned from gasoline and paint decades ago, lead that was deposited in soil, mostly from car exhaust particulates and flaking house paint, can remain there for a very long time. Gardeners used a variety of methods to address the issue of soil contamination. Some grow only fruiting plants in soil with high levels of heavy metals; others removed and replaced the soil in their gardens. Others have chosen to use raised beds filled with clean soil, sometimes with a water permeable fabric separating the bed from the original soil, or to regularly amend the existing soil with compost to dilute the concentration of contaminants and to reduce heavy metal availability.

We were very curious about whether gardeners had monitored for pollution from car exhaust. No one in our survey had. Such testing is expensive and is not feasible for small organizations to undertake. Not all managers felt that car exhaust warranted much concern. One manager expressed “[even] if our food that we grow has some of that chemistry, we feel that we’ve already breathed that in from our air.” While not evident from our survey, in some cases, gardeners use vegetative buffers to help filter car exhaust from the air.

### Recommendations

The best growing practices need to be used on this site to ensure that the produce harvested from it is safe for visitors to consume and to teach people how to safely grow food in their own backyards. Basic soil testing is easy and fairly inexpensive, but as we have learned from our survey, not all urban food gardeners regularly monitor their soil for pollution. Heavy metal soil contamination is a serious matter. Lead poisoning, which can easily occur from consuming food grown in contaminated soil, can cause permanent cognitive problems, kidney damage, and chronic pain. The Food Project<sup>29</sup> has responded to this issue by creating a youth lead program to help Boston community members test their soil. Working in conjunction with

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<sup>29</sup> For more information, visit <http://www.thefoodproject.org>.

The Food Project, MassHort could hold one or more high profile, celebratory soil testing days each year to draw the public attention to the issue. When teaching the public about the importance of soil testing, MassHort and other Greenway planners should emphasize that soil testing should be done on a regular basis, not just when the garden is built and regardless of the production methods used in the garden.

Arsenic contamination is another issue for concern. It is common for urban gardens to use pre-treated, rot resistant wood around the edge of their plots. Such wood may contain arsenic which can leach into the soil.<sup>30</sup> There are safe, durable alternatives (i.e. cedar wood, soy plastics, brick, etc) that can be used in the demonstration garden, and information about these alternatives should be shared with visitors and area urban gardeners.

The demonstration garden should use raised beds, filled with clean soil, which has been brought to the site for that purpose. A water permeable geo-textile fabric should be placed between the existing soil and the new soil to prevent the plant roots from growing into the existing soil. Using this fabric and the raised bed system will reduce the likelihood that contaminants will leach into the food plots from the surrounding area. Raised beds, if sufficiently high, can also be of benefit to visitors with handicaps and keep plants safe from toddlers and dogs. Compost should be added to the beds annually to replenish the soil with needed nutrients, and this should help reduce the risk of developing contaminated soil as well.

Finally, we think it would be of great benefit to community gardeners in Boston and around the world for MassHort to partner with Tufts University, UMASS Extension or with another local university to study how car exhaust and other ambient pollutants affect food crops. We were not able to find any research on the issue through our survey or through our literature review. This area simply has not received the attention it needs, and we are left with many unanswerable questions about the issue of air pollution and urban food production. Are airborne contaminants from car exhaust and industrial sources taken up by plants or are they left on the surface of the plants? Do they pose any risks for those who consume those plants? It may be costly to study this issue, but it is the responsible thing to do, and a partnership could make the study feasible.



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<sup>30</sup> There are two common types of treatments that contain arsenic which are applied wood to make it rot resistant: chromated copper arsenate (CCA) and ammoniacal copper arsenate (ACA).

## 7. Fencing and Buffers

While desirable to buffer the garden and visitors from the avenues of traffic, a poorly designed physical barrier between the public and the garden could give passersby the impression that the garden is “off limits.” We asked our interviewees for their thoughts on fencing and for suggestions for vegetative species best suited for creating buffers next to a busy road. Vegetative buffers, if chosen, must be hearty to remain aesthetically pleasing year round and prevent the garden from seeming abandoned. At the same time, vegetative buffers should not be allowed to be habitat for unwanted pests, such as rodents.

### Findings

Some of those surveyed felt that fencing should be tall and sturdy to prevent vandalism, while others felt that vandalism was inevitable, no matter the height of the fence. One garden manager voiced the opinion that fences create a barrier between the garden and the community. Her organization felt that having no fence was the best way to create an inviting atmosphere and opted to leave their garden completely unenclosed. There was general consensus, however, that fencing should have an open face if it is to be used. Solid fencing can make the community feel closed off from the garden, even if it is public space. A number of managers recommended using vegetative buffers to block the sound of traffic and to define the space but also expressed that dense barriers can potentially create hiding places and compromise the safety of those working alone in the garden. Visibility from within and from outside the garden, several managers iterated, will create a greater sense of safety for visitors and workers. One manager recommended that bushes be no higher than four feet so that most people can see over them.

Our interviewees offered advice on types of plants to use for vegetative buffers. Preference varied from person to person. Three managers suggested that fruiting bushes or trees be used to create vegetative buffers. In contrast, one manager felt that fruiting bushes should not be placed along the border of a garden since ripening fruits may lead people to unsafe areas along traffic routes. Two managers cautioned us about using trees along the perimeter of the garden as they can create too much shade and will compete with vegetables for nutrients. Other suggestions included using ornamental grasses, drought tolerant shrubs, native wild flowers, and perennial plants that will attract beneficial insects. The following plants were specifically recommended for the buffer: juniper trees, bayberry bushes, Russian sage, currant bushes, and Manhattan Euonymus. Out of concern that vegetative buffers might provide habitats for unwanted rodents, we asked gardeners who used shrubbery whether they had experienced any such problem. Fortunately, not a single respondent had experienced problems of rats nesting in their vegetative buffers. Rats are more likely to be attracted by compost piles, which, as we will discuss, can be “rat-proofed.”

### Recommendations

As we were told in response to our line of questions on “finger blight” and vandalism, gardens that are more exposed tend to experience less theft and property destruction. Because this demonstration garden would be in a very public area, we recommend that it not be enclosed

by a forbidding fence. Rather, the fencing should be about three feet, or lower, in height and should have an open face to maximize the visibility of the garden and park area. Making the garden visible from the outside will entice passersby to come in and explore it and will create a greater sense of safety within the garden area. If the demonstration food garden does experience an unacceptable level of theft or vandalism for more than a few years, then we would recommend installing a taller, more substantial fence that it is difficult to climb over. It should remain open faced, but should not have gaps wide enough for a person to crawl through.



An example of appropriate fencing  
*Courtesy of <http://landscaping.about.com>*

Ultimately, choice of a barrier for the demonstration garden will depend on its location, whether it is along the perimeter of the parcel or in a more central area. If it is along the perimeter, the garden should certainly be bordered by fence for the protection of children and by a thick vegetative buffer to filter out exhaust and particulate matter from automobiles. Instead, if the garden is in the center of the parcel, we recommend that the demonstration food garden space be delineated by a border of ornamental grasses, flowers, or fruiting bushes to create a more intimate learning area. A waist high fence might also strengthen the identity of the food garden space. Reiterating the sentiment of the garden managers we interviewed, vegetative buffers should be no more than 3-4 feet tall to maximize visibility and to improve the safety of the space. We think that fruiting bushes would be a great option for a border if the demonstration garden is in the center of the parcel. Fruiting bushes, ideally, will evoke the curiosity of those walking by drawing attention to the demonstration garden. However, we recommend that fruiting bushes not be used as a border along the perimeter of the parcel as we do not want people to consume fruit from a bush that is acting as a filter for exhaust and particulate matter and alongside a dangerous roadway.

We recommend that planners be conscious of the placement of trees in the proximity of the food garden. While all of the parcels receive enough sunlight to support a vegetable garden, tree canopies can greatly reduce the hours of direct sunlight that would reach the plants in the demonstration garden. Most vegetables need about 6 hours of direct sunlight to be successful and a sunlight study of this parcel undertaken by Halverson Landscape Design demonstrates that adequate sunlight is available (see appendix A for the sunlight study). Ultimately, the design of the garden should be in harmony with the surrounding park space. Once the design of the park area is developed, it will be easier to determine how the demonstration garden will fit into the space.



## 8. Wildlife and Pets

We asked urban gardeners about how they handled non-human visitors to their gardens. There is always potential for a number of creatures to become unwanted guests, possibly causing damage to the plants and creating food safety problems. Located in a highly urban setting, the demonstration garden staff is likely to encounter rats and squirrels. As the garden is also located blocks from the harbor, seagulls may be an issue. Urban gardeners also face the question of allowing pets into the garden. While many city residents are on the lookout for pleasant places to walk their dogs, dog owners would need to be especially careful about monitoring and cleaning up after their dogs in a food garden.

### Findings

The gardeners surveyed experienced an array of wildlife and pet visitors. Respondents had particularly strong responses to the question of whether they allowed dogs in the garden area. Some gardeners felt that dogs posed an unnecessary food safety risk and are more trouble than they are worth. Another gardener stated that a toddler can do as much damage as a dog, and at least people leash their dogs! Gardeners were almost evenly split in whether they allowed dogs or not (see Table 1). Notably, those gardeners who did allow dogs reported few problems with either waste or digging. Given that the food garden is located in part of a larger park, it may behoove food garden planners to allow dogs or simply to use the same standards as the entire Greenway. Few gardeners reported having policies about cats. One garden had a “resident” cat, while another had problems with strays. As cats are rarely leashed and the food garden expects many visitors, it is probably best for the garden not to allow cats.

Rats were the most commonly cited problem pest, followed closely by squirrels (see Table 2). Rats were primarily drawn to the compost. Squirrels, on the other hand, caused problems in the garden itself. One gardener suggested planting sunflowers, which distracted squirrels from the fruiting food plants. Other gardeners made similar suggestions -- to “plant enough for everyone.” A variety of other pests were unique to particular gardens. Two important points arose from the interviews. First, pest problems tended to be minor; none were debilitating. Second, gardeners were able to devise creative solutions as problems arose. The demonstration garden staff would need to be problem solvers as well.

	Allowed	Not Allowed
Dogs	36%	40%
Cats	8%	4%

Rats	44%
Squirrels	40%
Feral pets	20%
Pigeons/Birds	12%
Deer	8%
Prairie dogs	4%
Raccoons	4%
Skunks	4%
Woodchucks	4%

## Recommendations

The gardeners' experiences in the study tell us to expect the unexpected! Gardeners will need to be creative as they respond to pest problems. The most common recommendation, as noted in the "composting" section, is to use rodent-proof composting bins.<sup>31</sup> While the gardeners in the study were divided on whether to allow dogs, those who did experienced few problems. Many urban residents will already be walking their dogs along the Greenway, and we certainly do not want them to avoid the garden because their pets are unwelcome. We suggest allowing leashed dogs on a trial basis and implementing a ban only if the dogs become a problem. This trial would include signs reminding people both to control and clean up after their dogs in the garden.

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<sup>31</sup> Sinking bottomless built bins a few inches into the ground will prevent animals from being able to easily dig their way into the compost.

## 9. Composting and Storage

The demonstration garden may only be given a small area, and staff must consider how to store equipment and effectively manage waste in the garden. It would be most efficient to consolidate equipment for the three plots managed by MassHort. Composting offers the opportunity to utilize waste both for fertilizer and education. We surveyed urban gardeners about their management of equipment and waste.

### Findings

All those surveyed reported using sheds for storage. One gardener advised creating a multi-purpose shed incorporating shelter and benches nearby. Thus, the shed becomes an attractive part of the garden, rather than a necessity tucked in a corner. This may also reduce break-ins. Almost all respondents composted on-site. Only one gardener did not compost, as the garden was just starting up, but she intends to do so in the future. Bin systems are utilized at 78% of the gardens, with 11% each using layer and heap systems. A variety of types of bins were used: plastic, plastic with screw-top lids, wood, and wood and chicken wire. Gardeners did not recommend a particular kind of bin, only that it be rodent-proof. Some were hand-built and others purchased. Twenty-seven percent reported adding free materials from outside the garden to their composting system, including produce scraps from a grocery store and used coffee grounds from a coffee shop.

### Recommendations

The garden will require a small shed (unless MassHort constructs a building on another parcel) as well as compost bins. In both cases, the garden staff should consider how to add value and include participation. Rather than put the shed and compost bins in an out of the way place, they should be well-decorated and integrated into the garden design, perhaps in conjunction with seating. Here is an opportunity to gain sponsorship by asking for material donations and volunteers for construction. The shed offers the opportunity to highlight green construction techniques, like straw-bale or cob construction, which then educates visitors. The only restriction on the compost bin design is that it must be rodent-proof. There should be signs around the compost bin explaining how compost works and occasional programming on how to compost at home. While the composting system may initially be small, planners should consider what organic waste is generated locally (i.e., leftover coffee grounds from a nearby coffee shop) that would make a good addition to the compost. As much garden waste should be composted as possible, to minimize trash generated by the garden.

## 10. Staff and Budget

The word “garden” presupposes a gardener, and thus we turn to staff and budgeting for the food garden. The food garden will require staff not only familiar with plants, but with people. Besides being concerned with the horticultural details of tending the garden, the staff will be responsible for educational programming, festivals, and outreach. The garden will need a standing budget for staff and materials, with the possibility of obtaining donations and earning revenue through fund-raisers and events. We asked urban gardeners about how they handled their budget and staffing needs.

### Findings

Of the gardens surveyed, 72% had paid staff, while 28% relied solely on volunteers for staffing. Staffed gardens relied on an average of two full-time equivalent employees. Most of the gardeners recommended one full-time paid staff member for a garden the scale of the proposed Greenway demonstration garden, with volunteers and interns to supplement.

Gardeners attracted volunteers through a variety of means. They established mailing lists and advertised at coffee shops, on Craig’s List, in local newspapers, and at food co-ops. Many relied on student volunteers, including youth sentenced to community service. The average budget of all gardens surveyed and reporting budget information was \$143,000.<sup>32</sup> One garden organization had an extraordinarily large budget of \$800,000 to serve many gardens. Removing this outlier, the average annual garden budget was \$49,000. Staff was the top cost (59%), followed by insurance (12%), and soil amendments, plantings, building costs, irrigation, and land rental (6% each).

Gardeners offered an array of suggestions for obtaining materials for free. Once the garden is established, it can provide some of its own seeds and fertilizer, with free composting amendments such as coffee grounds sourced from local businesses. Seed saving and composting could provide the basis for courses; students would thus provide labor for these processes. Architecture and design students might be sought out to build paths or a shed in the garden. Sustainable building organizations often offer courses in building; the garden staff might make the garden a site for such an event, yielding a shed and public visibility of garden activities. Seeds and plantings can often be obtained for free; alternately, garden staff might contract with farmers to grow seedlings for the garden and extras for fundraisers. Some events should be specifically geared towards fund-raising, while other programming may require a fee simply to cover costs.

### Recommendations

The garden will need at least one full-time staff person year-round to manage both the plantings in the garden as well as the equally important tasks of outreach and programming. Additional assistance may be obtained through the Americorps program or by employing

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<sup>32</sup> 68% of gardens surveyed reported budget figures.

summer volunteers. The staff should organize volunteer days as the garden is designed and planted to start getting the word out about the garden and building a volunteer base. As recommended in the “audience” section, outreach to neighboring offices and community groups will help increase the number of volunteers. The demonstration garden’s setting provides two unique opportunities. The close proximity of many office buildings makes the garden an ideal site for corporate service events. Additionally, Boston has one of the highest concentrations of university students of any city in the county. This labor pool can be tapped through community service programs during the school year and internship programs during the summer. Students at the Agriculture, Food and Environment Program at Tufts University are an obvious source of employees, as most of our students have gardening experience and a love of the soil.

The garden budget could range widely depending on garden design. The garden should be designed to close ecological loops as much as possible. Such activities would include saving seeds and composting, which both increase the environmental sustainability and save on costs. The garden organizers should also think creatively about how obtaining sponsorships for initial seeds, plantings, a shed, etc, would both save money and leverage support for the garden, possibly leading to volunteer or other support in the future. These suggestions will assist in using available funds most efficiently.

## V. Community Input

The purpose of our research was threefold: to conceptualize and refine possible themes for the garden, to gather expert advice through a survey of urban garden managers in the U.S. and Canada, and finally, to present our findings and ideas to city stakeholders involved in the project at a public forum. This public forum was especially crucial, given the high public visibility of the project and the politics surrounding the project. Due to the long history of disagreement and discord among the various stakeholders and the urgent need to make some visible progress on the project, we wanted to make the planning process transparent and inclusive. We felt that the forum was an opportunity to present our garden theme proposals and preliminary findings of the urban gardener survey as well as an opportunity to solicit opinions and insight from varied stakeholder constituencies.

Of the 120 invitations that went out to neighboring civic associations, city government officials, local non-profits, and representatives of those in the greater Boston community concerned with issues of food, agriculture, and green space, approximately 35 people attended a public forum on February 5, 2007. At the culmination of the presentation, a short questionnaire was passed out to the members of the audience (see Appendix E for a copy of this questionnaire) to gauge their response to garden possibilities. We received 30 completed questionnaires.

The first question in the questionnaire asked audience members if they thought a small demonstration garden on the Kennedy Greenway could be attractive and offer educational opportunities. Overwhelmingly, every response affirmed that the demonstration garden would be a positive addition to the Greenway. For example, two respondents wrote:

“Absolutely, I think it’s very important especially in an urban environment to keep people connected to nature and bringing people back to the roots of where food comes from.”

“Sometimes community gardens can be exclusive. I am excited by the prospect of a garden that is welcoming to visitors.”

Some individual’s comments pointed to the importance of connecting this garden with local community institutions (i.e. Boston Public Markets) and community organizations. Others offered advice as to who would most likely benefit from this space:

“I think that schools and school children could especially benefit, and local workers who are in the area would love it as a place to stop during breaks, walks in garden, etc.”

“I particularly think neighborhood residents and families are the key audience.”

The second question asked people which of the three possible themes they liked best: (A) “Eating Healthy in the American Garden,” (B) “Boston’s History through Food and Agriculture,” or (C) “The World Garden: Highlighting Boston’s Diversity.” Many people ranked their choices, so choices were given a numeric value and each person was able to vote for

their favorite. While many people repeated that all three themes were compelling, the most popular choice was the “World Garden: Highlighting Boston’s Diversity” (see Table 3).

<b>Eating Healthy</b>	<b>History Garden</b>	<b>World Garden</b>
<b>58</b>	<b>48</b>	<b>74</b>

Though this theme was remarkably popular, we realized from one person’s insightful comment that it may be difficult to successfully implement:

“I would be concerned about ‘rotating’ themes, especially among ethnic groups, from year to year because people would need continuous involvement over several years in order to feel truly vested. Also people might not appreciate their year’s work torn out only to be replaced by something else. This would also preclude the year-to-year fine-tuning that goes into a successful garden.”

Not satisfied with one single theme, a number of people suggested that the garden incorporate aspects of each theme:

“I like having all of the themes in one garden, and you want something adaptable that can be improved upon over time, so maybe switch themes year to year. I like the idea of a complex garden with multiple themes (with walking tours organized maybe different colored signs/tags for different ‘tours’).”

“Can you incorporate the healthy theme into the others as a sub-theme? Healthy can also have ‘negative’ perceptions with some folks, especially kids at least initially.”

“Incorporating culture into any [theme] seems key.”

Whatever the theme, people stressed the importance of creating a garden that will involve the community. As one audience member stated:

“I think the most successful urban gardens have a lot of involvement by the community.”

Finally, the last question asked for additional insight and ideas. People offered feedback on the garden’s programming, maintenance, and size. Some programming feedback included:

“[The garden should be used] to teach urbanites how *they* can garden at home (container gardening).”

“I like the idea of having a map of all the Boston community gardens.”

Regarding the upkeep of the garden, one person shared:

“My largest concern would be maintaining this space, many green spaces in this city are neglected and gardens seem to often be the worst offenders.”

Finally, two audience members expressed their hope that the garden to be somewhat larger:

“1/3 acre is TINY. Hopefully MassHort will decide to donate/designate more land after they see this presentation”

“It would seem that being able to enlarge the garden a bit might make it more attractive to visitors.”



## **VI. Conclusion**

Not often does such an opportunity arise. In the midst of one of the most densely populated cities in America, rare and coveted space has opened up. Boston is poised to be an innovator in urban greening; calls for bold and exciting uses of the long-awaited Rose Fitzgerald Kennedy Greenway are deafening.

In this report, we deliver a vision for a small parcel of the Greenway. We propose construction of a demonstration garden, to occupy less than one fourth of an acre. Despite its small size, we anticipate significant impact. The garden will be a wonderful educational tool. School children will use the garden to learn about where food comes from and teachers will integrate lessons in the garden into their science curriculum. Community gardeners will use the garden to test out and communicate about foods that grow well in our urban environment. Food enthusiasts will make the garden a hub for cooking demonstrations, utilizing fresh ingredients grown on site. Nutritionists will use the garden to highlight the importance of fruit and vegetable consumption to battle obesity. All community members will celebrate the harvest through festivals and activities.

When the idea of a demonstration garden first surfaced, citizens and policymakers raised several reasonable concerns. Will food plants survive? Should pets be allowed near or in the garden? Will ambient pollutants contaminate food grown on the Greenway? Will the space look dead in the winter? Our team tackled these and other questions systematically. We surveyed urban garden leaders in the U.S. and Canada to get expert advice which is presented in this report. In all cases, we found satisfactory answers and provide recommendations to Greenway developers.

To help people better understand the potential of a demonstration garden, we developed three potential themes around which garden construction and programming could be designed. The first theme focuses on healthy eating, designed for nutrition education and production of familiar fruits and vegetables. The second theme focuses on Boston's culinary history, with crops such as fiddlehead ferns and concord grapes, and development of a 'food trail' to link up to the world famous Freedom Trail. The final theme focuses on immigrant groups that have enriched our cuisine with bokchoy, thai basil, tomatillos and other crops. In the spring of 2007, we presented these themes at a public meeting to gather and incorporate community feedback. The crowd was enthusiastic about all three and found it difficult to choose one. Whatever garden theme is selected—one of the three proposed or something entirely different—our work has clearly generated support for a food garden on the Greenway.

## About the Authors

**Rachel Beckhardt** received a Bachelors degree in Psychology and Women and Gender Studies from Bates College. She will receive her Master of Science in the Agriculture, Food and Environment Program at Tufts University Friedman School of Nutrition Science and Policy in May 2007. She is currently a Project Analyst at Environmental Defense in the Corporate Partnerships Program, and was previously a research analyst at SJH & Company, an agribusiness and renewable energy firm in Boston, while earning her M.S. in the Agriculture, Food, and Environment program at Tufts. Before graduate school, Rachel led groups of up to 50 people on educational tours throughout the US.

**Sarah Borrón** received a Bachelors degree in Environmental Studies and Religion from Denison University. She will receive her Master of Science in the Agriculture, Food, and Environment Program at Tufts University Friedman School of Nutrition Science and Policy in May 2007, specializing in non-profit management. Sarah previously worked in DC advocating for federal farm-to-school legislation and is a former Congressional Hunger Fellow. Sarah completed her AFE Program internship with the FAO of the United Nations in Rome, Italy.

**Emily Ladow** received a Bachelors degree in French Language and Literature from the University of Vermont. She will receive her Master of Science in the Agriculture, Food, and Environment Program at the Tufts University Friedman School of Nutrition Science and Policy in May 2007. Her area of specialization is natural resources management. Her other work experience ranges from organic farming to finance. Emily completed her AFE Program internship with the M.S. Swaminathan Research Foundation in Madras, India.

**Amelia Lo Dolce** received a Bachelors degree in Environmental Studies and in Philosophy from the State University of New York at Binghamton. She will receive her Master of Science in the Agriculture, Food, and Environment Program at Tufts University Friedman School of Nutrition Science and Policy in May 2007, specializing in urban planning and policy. Prior to her career at Tufts, she opened a vegan, kosher café at SUNY Binghamton, which she managed for two years. Amelia completed her AFE Program internship with the Sustainable Agriculture Coalition in Washington, DC.

**Kathleen Merrigan** received her Ph.D. from MIT in Public Policy and Environmental Planning. She is Director of the Agriculture, Food and Environment Program. Previously, Kathleen was Administrator of the USDA Agricultural Marketing Service, staff to the U.S. Senate Committee on Agriculture, and policy analyst at the Wallace Institute for Alternative Agriculture.

The AFE Program fuses the disciplines of nutrition, agricultural science, environmental studies and public policy. Students in the AFE Master of Science and Doctor of Philosophy programs learn to evaluate the ecological, political, economic and social aspects of food production and distribution. Information on the program is found at: [nutrition.tufts.edu/admissions/programs/afe](http://nutrition.tufts.edu/admissions/programs/afe)

# Appendices

## Appendix A: Daylight Study



**GREENWAY BOTANICAL GARDEN - COMPOSITE SUNLIGHT STUDY FOR SITE**  
Massachusetts Horticultural Society - Boston, MA

HALVORSON DESIGN PARTNERSHIP

## ***Appendix B: List of Survey Participants***

- Oakland Community Gardens (Oakland, CA)
- CityFarmer (Vancouver, Canada)
- Food Share (Toronto, Canada)
- Hillcrest Park Community Garden (Toronto, Canada)
- New Haven Land Trust (New Haven, CT)
- Denver Urban Gardens (Denver, CO)
- Atlanta Community Food Bank (Atlanta, GA)
- Consultant (unnamed) (Portland, ME)
- Groundwork Lawrence (Lawrence, MA)
- Newton Community CSA (Newton, MA)
- Dowling Community Farm (Minneapolis, MN)
- Farm in the City (St. Paul, MN)
- Massachusetts Ave Project (Buffalo, NY)
- 6/15 Green Community Garden (NYC, NY)
- Clinton Community Garden (NYC, NY)
- Harlem United Gardeners (NYC, NY)
- Liz Christy Garden (NYC, NY)
- West Side Community Garden (NYC, NY)
- Rochester Roots (Rochester, NY)
- Capitol District Community Gardens (Troy, NY)
- Civic Garden Center (Cincinnati, OH)
- Franklin Conservatory (Columbus, OH)
- Southside Community Land Trust (Providence, RI)
- Sunshine Gardens (Austin, TX)
- Sustainable Food Center (Austin, TX)

## ***Appendix C: Interview Protocol***

### **I. Purpose of the Study**

Four MS candidates from the Agriculture, Food, and Environment Program at Tufts University's Friedman School of Nutrition Science and Policy, together with their faculty advisor Dr. Kathleen Merrigan, are acting as consultants to the Massachusetts Horticultural Society (MassHort) for the development of a food garden on parcel number 21 of the new Rose Fitzgerald Kennedy Greenway. This project is a part of the students' required directed study – original research in the students' field of study.

As a part of this directed study project, the students, if approved, will interview the managers or head farmers/gardeners of urban vegetable gardens in the U.S. and Canada to learn more about how their organizations have dealt with common issues surrounding urban agriculture including but not limited to: pollution, vandalism, accessibility, and staffing.

Collected data will be used to better advise MassHort on creation of a well-designed garden serving the needs and desires of Boston's residents and minimizing any costs to the neighborhood or to MassHort.

### **II. Background and Rationale**

#### **A. Background**

MassHort has been given responsibility for developing three parcels of the new Rose Fitzgerald Kennedy Greenway. In one of the smaller plots, they would like to create a food garden containing vegetables, perennial fruit trees, and vines. Mr. Roy Blomquist, MassHort's Greenway Project Manager, arranged with Kathleen Merrigan to work under the consultation of the Tufts group, whose expertise is in the area of agriculture and its connections to nutrition, the environment, and community food security.

In September, we began to research other urban food garden projects across the country to find examples that were relevant to our project. Realizing that we would benefit most from actually interviewing managers of these projects, we decided to create a questionnaire that would cover a range of issues concerning urban food gardening. The attached questionnaire is a collaborative product of our group; we also received input from colleagues both within and without the program. Background research was done on each issue area in order to better develop our questions.

## B. Rationale

The information gathered during this study will help us to design a proposal for a food garden that would be aesthetically pleasing, safe, and engaging for visitors. We hope to learn from the invaluable experiences of other urban farmers/gardeners to maximize community benefits and to minimize costs and externalities in the design of our proposal. In addition, we will be writing a report summarizing our findings; this report will be made available to others interested in urban food production who might benefit from the information as well.

## III. Research Plan

### A. Experimental design

This study will specifically involve the collection of individual responses to common problems surrounding urban vegetable gardening. Study participants have been chosen non-randomly. Participants will be individuals who manage or are head growers at urban farms/gardens in the U.S. and Canada. Data will be collected via one-on-one, one-time telephone interviews. Interviewers will be the four graduate student co-investigators listed above. Prior to beginning the study, the interviewers will receive copies of the protocol and script and will be briefed on both. Each interviewer will receive a list of approximately twenty potential participants and their contact information. The attached script will be used to conduct each interview.

Interviewers will contact potential participants by phone and shall attempt contact no more than three times. If no one answers a particular call, interviewers will leave a brief explanatory voice message and a telephone number for replies. If no contact is made by the third attempt, the organization will be struck from the participant list. If an identified farmer/gardener does not wish to participate in the survey, the organization will be struck from the participant list. If at any time the interviewee wishes to terminate the interview, he or she has the right to do so and the organization will be struck from the participant list. Interviewers will continue to contact potential participants until a minimum of 40 interviews have been completed. Interviewers will record responses in typed notes to be compiled and analyzed at the end of the study.

### B. Sample size and statistical analysis

We have a list of 78 potential interviewee organizations. We will interview a minimum of 40 individuals from different organizations. A qualitative analysis will be used to summarize the responses, to help us design our own project proposal, and to use anecdotally in our report and any presentations on the subject.

### C. Subject Characteristics

Subject criteria: Subjects will be men and women who work on urban farms/gardens in the U.S. and Canada and who feel qualified to answer the questionnaire.

- a) Inclusion criteria: Preference will be given to urban farms/gardens in areas whose climate is similar to that of Boston. Preference will also be given to those farms/gardens in very urban areas with high levels of surrounding vehicular traffic, as traffic safety and pollution monitoring are two high-priority concerns for the potential Greenway garden.
- b) Exclusion criteria: No potential subject will be excluded if we believe that he/she may have useful advice or insight to contribute.
- c) Withdrawal/Termination criteria: We don't anticipate the need for any withdrawal or termination criteria. Potential subjects may of course decline to participate.

#### D. Risk/benefit assessment

- 1. Risks: We do not believe that there will be any physical, psychological, or social risk accompanying participation in the study. The only potential risk of participation might be economic, if time spent responding to our questionnaire causes the subject to neglect work responsibilities.
- 2. Benefits: We believe there will be benefits to individual participants (who will have access to our report post-study to improve their own operations), to the general population of people dedicated to urban farming/gardening, and to the Boston community (in the form of green space and public education).

#### E. Subject Participation

- 1. Recruitment:  
A list of 78 potential participant organizations has been compiled through internet research and through outreach on the Community Food Security Coalition ListServe, which is managed by Tufts University staff. A large portion of the list was generated from the American Community Gardening Association's online member list. Organizations were selected in part according to their location. Preference was given to organizations with urban projects; those operating in more rural settings were not selected.
- 2. Informed consent:  
We are applying for a waiver of consent due to the minimal risk of our study. If necessary, however, we can request verbal consent at the start of our interviews, or can electronically send consent forms to individuals and have them return the completed forms by fax. Interviewers will explain our project using the prepared script. The potential participant will then be asked whether or not he or she wishes to participate in the survey. Participants will be given the option to remain anonymous in our presentations and written reports.
- 3. Study performance location:  
Interviews will be conducted by phone either in the principal investigator's office at Tufts University's Jaharis Building or in a private area of the interviewers' homes. Notes taken during the interview will be kept on the

personal computer of the interviewer and then compiled centrally on the Tufts University Science Knowledgebase (TUSK) course site for the project, which is only accessible to Professor Merrigan, the principal investigator, and the four students involved in this study. At the end of the 2006-2007 school year, the principal investigator alone will hold these files. She will be responsible for destroying the associated computer files five years from the completion of the study.

#### 4. Personnel:

The following Masters students at the Friedman School of Nutrition Science and Policy will be responsible for conducting the interviews in private: Rachel Beckhardt, Sarah Borron, Emily Ladow, and Amelia LoDolce. If not granted a waiver of consent, the above interviewers will also be responsible for obtaining informed consent verbally from the participants. There will only be one computer file for each interview that will be held by the respective interviewers until the file is transferred to the TUSK course site, which is collectively managed by the five participants of this project. As stated above, these files will be held by the principal investigator after completion of the study and will be destroyed five years from the date of completion.

#### 5. Subject fees:

Subjects will not receive any payment for participation and will be informed as such before they are asked to participate. It will also be stated on the informed consent form, if one is required, that no payment is being offered in exchange for participation.

#### 6. Confidentiality:

Prior to the interview, each subject will be asked whether he or she wishes to remain anonymous during discussions of our survey responses. If the subject does not request to remain anonymous, we may use his or her name and the name of the organization in our presentations and in written reports. We do not foresee any potential injury whatsoever to the participants as a result of a public discussion of their experiences in urban farming/gardening.

The participants' names will be recorded on our questionnaires, but the five members of this project will be the only people who may access the completed questionnaires.

#### 7. Collaboration:

We are collaborating with the Massachusetts Horticultural Society (MassHort) as, essentially, a consultant for their Greenway project. However, this survey is ours alone, and the completed questionnaires will not be available to MassHort. We will, however, brief them on our findings and provide access to our formal report.



## *Appendix D: Survey Questionnaire*

### **URBAN AGRICULTURE Questionnaire for Managers of Existing Farms/Gardens**

**Interviewee:**

**Name of the Organization:**

**Location:**

**Size (Acreage):**

**Interviewer:**

**Date:**

**Website (if applicable):**

**Could you briefly describe your organization's activities?**

**Please describe the built environment surrounding your garden (i.e. residential, industrial, mixed use, traffic, etc).**

### **Urban Gardening Problems**

#### **1) Audience Traffic**

*Issue:* We want to make this garden attractive to a variety of people (i.e. tourists, families, students of all ages, the local work population, etc).

Questions:

- 1) What sort of visitors does your garden have?
- 2) How you attract visitors to your garden?
- 3) Do you reach out to different cultural groups? How?
- 4) Do you advertise as a space for school and community group service learning? Corporate retreats/community service days?
- 5) Is there a population that you would like to attract that you have not been able to attract?
- 6) What programming do you have that reaches out to community members?
- 7) Have you tried different methods in the past that weren't as successful?

#### **2) Fencing and Buffers**

*Issue:* The garden may require some kind of fence or vegetative barrier to create a buffer space between it and the highway. We want to maximize the year-round aesthetic of such a buffer and ensure that the garden appears welcoming, with obvious entrances, and does not entirely block out the garden from view. We also don't want the bushes to provide cover for rodents.

Questions:

- 1) What kind of shrub or tree would be hardy enough to thrive near a highway?
- 2) How much maintenance would be required for trees versus shrubs versus a fence?
- 3) Do bushes provide unwanted rodent habitat?

- 4) What is the most attractive option that would create an inviting look and not make visitors feel unwelcome?

### **3) “Finger blight” and Vandalism**

*Issue:* Garden visitors may feel tempted to help themselves to vegetables and fruits in the garden. We are also concerned about potential acts of vandalism and destruction. While we want to create an inviting atmosphere, we would like to minimize our loss of produce and property.

Questions:

- 1) Do you keep your garden locked? If so, for what hours?
- 2) Does your garden experience acts of vandalism or theft?
- 3) What have you done to deter “finger blight” and vandalism (other than locked fencing)?
- 4) Do you know of methods that others have used?

### **4) Traffic/Safety**

*Issue:* We expect that families and children may be visiting the garden, and it is located in a very high traffic area.

Questions:

- 1) Do you have concerns regarding safety and traffic in the area around your garden?
- 2) What do you do to address such problems?

### **5) Ambient Pollutants**

*Issue:* We want to be sure that what we produce in the garden is, without a doubt, safe for consumption by all. Therefore, we are working to develop a plan for monitoring pollution.

Questions:

- 1) Is your farm/garden situated in close proximity to urban traffic or other pollution sources?
- 2) How much of an issue has ambient pollution been on your farm (versus pre-existing contamination - in the case of farming on a brownfield)?
- 3) Do you regularly monitor levels of ambient pollutants in your farm/garden?
  - a) In your soil?
    - i) How often?
    - ii) At what time of year?
  - b) In your crops?
    - i) How often
    - ii) At what time of year
    - iii) From what portion of plants?
  - c) In collected rainwater?
    - i) How often?
- 4) If you have observed pollution, what pollutants were most problematic?
  - a) Lead
  - b) Arsenic
  - c) Cadmium

- d) soluble salts from roadways
- e) Chromium

- 5) What “tolerable levels” do you use? (EPA guidelines?)
- 6) Was it necessary for you to do any lead or other heavy metal remediation prior to cultivation of your first crops? If so, what methods did you use?
  - a) phytoextraction,
  - b) rhizofiltration
  - c) phytostabilization
- 7) If heavy metals are present, what do you do to minimize uptake by crop plants?
  - a) Liming soil?
  - b) Ensuring sufficient drainage?
  - c) Addition of organic matter?
  - d) Applying phosphate
- 8) Does your farm/garden have a buffer planting of shrubs etc. between roadways and beds of crops? If so, has a particular species done the job well?
- 9) Do you give preference to fruiting plants over leafy plants and root crops to limit possible heavy metal consumption?
- 10) Does your farm/garden have posted signage about the dangers of ingesting soil or eating unwashed produce?

## **6) Winter Aesthetics**

*Issue:* It is very important for our garden to be aesthetically pleasing throughout the entire year.

### Questions:

- 1) Is winter appearance of your garden/land an issue? (only applicable for gardens situated in temperate areas)
- 2) If so, how do you ensure that the space is aesthetically pleasing in the winter?
  - a) Do you use a cover crop?
    - i) If so, what species?
  - b) Do you mulch or otherwise cover beds for the winter?
  - c) Do you use any cold frames to continue cultivation into the winter or to begin earlier in the spring?

## **7) Annuals/Perennials**

*Issue:* We are interested in having a variety of crops and would like to have a mix of annual and perennial plants.

### Questions:

- 1) What is the balance of annual and perennial species in your garden?
- 2) Do you have any fruit trees?
- 3) Do you have any perennial bushes or vines?
- 4) Do you layer plantings to maximize space?

- 5) Do you use species native to the area or have you experimented with species from outside the region?

## **8) Wildlife/Pets**

*Issue:* The garden may attract animals such as squirrels, rats, and pigeons that eat the produce, preventing its use. These creatures may also prove a nuisance to visitors and a sanitation issue.

### Questions:

- 1) What are the best organic means to detract rodents and other creatures from a garden?
- 2) What crops or types of plantings are most likely to attract rodents?
- 3) How much do rodents cause a decrease in visitors to an urban park/garden?
- 4) Do you have problems with people not cleaning up after their pets? If so, what have you done to address the problem?
- 5) Do you allow pets in the garden?

## **9) Food Disposal**

*Issue:* Some of the garden waste will be great for compost, but how do we dispose of other food waste?

### Questions:

- 1) How do you dispose of non-composted waste?
- 2) How can we dispose of waste in an appealing (or rather, doesn't ruin the visual aesthetics), educational and orderly fashion?
- 3) Are there any disposal methods that you tried that have not been successful?

## **10) Storage/Compost**

*Issue:* The garden will require a variety of equipment as well as an area for compost.

### Questions:

- 1) Does your organization compost on site or off site?
- 2) Describe what method of composting you use.
- 3) What is an attractive means to store tools and equipment on-site, or should these items be brought in and out for use?
- 4) Do you have a specific brand/style of composting bin that you would recommend to others?
- 5) How can composting be done in a way that's educational and does not attract pests?

## **11) Labor**

*Issue:* Upon completion of project, how will MassHort maintain a supply of labor to maintain, protect, and educate about the public space?

### Questions:

- 1) How is your paid staff broken down (Full time, part time, seasonal, etc.) and how many Full Time Equivalents do you have?
- 2) How do you attract labor?
- 3) Do you recruit volunteers? How does your volunteer program work?

- 4) Do you have interns? How does your internship program work?
- 5) Do you advertise as a space for school and community group service learning? Corporate retreats/community service days?

## **12) Program Costs**

*Issue:* We are trying to get a feel as to the costs one must incur to maintain an urban garden to better design our program. (*\*note, people may not be able to answer these questions off the cuff. So don't be shy about asking for their audited financials- it's entirely public information if they are a non-profit*).

### Questions:

- 1) What is the biggest expense for your operation?
- 2) Is there any expense that surprised you, that you did not anticipate?
- 3) Do you use fees to generate income? If so, for what programs?
- 4) Would it be possible to get a copy of your audited financial statements? If so, please fax it to 617-636-3727 attention to Amelia LoDolce.

*Appendix E: Community Meeting Feedback Questionnaire*

**Keeping the *Green* in the Rose Fitzgerald Kennedy Greenway:  
A Public Forum**

**Monday February 5, 2007  
Tufts University Friedman School of Nutrition**

1) Do you think that a small vegetable garden would be an attraction and a good educational opportunity for students, tourists, and local workers in Boston? \_\_\_\_\_

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2) Which of the three proposed garden themes did you find most compelling?

A. \_\_\_\_\_ “Healthy Eating in the American Garden”

B. \_\_\_\_\_ “Boston’s History Through Food and Agriculture”

C. \_\_\_\_\_ “The World Garden”

D. Do you have another theme idea you’d like to share?

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3) Do you have any other ideas or comments you’d like to share with us?

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Many thanks for taking the time to attend the forum, and for your feedback.

Rachel Beckhardt, Sarah Borrón, Emily Ladow, Amelia LoDolce, and Kathleen Merrigan

