Acknowledgements
I wish to express my indebtedness and gratitude to those who have influenced this work. Firstly, I thank the members of my Thesis Committee for their guidance, input, and support of this project. Those members are: Joe Blalock, Associate Professor, Department of Landscape Architecture and Chair of my Thesis Committee; Jody Rosenblatt-Naderi, Chairperson, Department of Landscape Architecture; and Junfeng Jung, Assistant Professor, Department of Urban Planning.

Along the way, I also had the pleasure of collaborating with others who have enriched this work. I am thankful for the participation, mentoring, and thoughtful direction received from Martha Hunt, Associate Professor, Department of Landscape Architecture; Dr. Jane Ellery, Assistant Professor and Associate Director of the Fisher Institute for Wellness and Gerontology; Dr. John Motloch, Professor, Department of Landscape Architecture; Bo Zhang, Instructor, Department of Landscape Architecture; and Burcu Yigit-Turan, Instructor, Department of Landscape Architecture.

While completing this work, I was privileged to work with Indy Urban Acres stakeholders. Their enthusiastic support and focus on this work was informative and thought-provoking. I wish to thank Don Colvin, Deputy Director, Indianapolis Department of Parks and Recreation; Lori Hazlett, Interim President, Indianapolis Parks Foundation; Jenny Burrough, Community Affairs Director, Indianapolis Parks Foundation; Laura McCarthy, formerly of Indiana University Health; Robin Eggers, Director for Community Outreach and Engagement, Indiana University Health; Tyler Gough, Farmer, Indy Urban Acres; and Ned Brockmeyer, Assistant Farmer, Indy Urban Acres.

Lastly, I wish to thank both Jim Stout at Indianapolis Mapping & Geographic Infrastructure System and Annette Darrow at Indianapolis Public Transportation Corporation for compiling relative GIS information.
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I am both a full-time student, as well as a full-time practicing professional, so mine is somewhat a unique journey through the study required for my Master’s degree in Landscape Architecture. I began this journey because I believe in lifetime learning, both personally and professionally. With almost fifteen years of private-sector practice experience and an upcoming invitation to become a Principal within my firm, I felt the need to broaden my own knowledge-base and my own planning and design approach in order to emerge with new relevance and purpose in “post-recession practice”. I was hoping to discover a smarter and more complete method of practice that responds to the realities of our new economy.

To satisfy this urge, my initial instinct was to demonstrate the central planning and design role landscape architects play across all things affecting personal and community health in our built environment. Things like food systems, connectivity, land use, open space, safety, and on and on. Very quickly, I realized that within the short timeframe of a Master’s degree, I would only be able to scratch the surface of investigation on a study of such breadth. I concluded that scratching the surface on a big project would not satisfy my goal of emerging from this with new relevance and purpose, and instead set out to focus my work on reaching greater depth with a smaller project.

In identifying this smaller project, I called upon personal experience. I grew up in a family where food on a daily basis could not be taken for granted, and where food stamps, powdered milk, and government cheese were routine. Though I’ve been lifted out of that situation, I now see my parents battle chronic illness. These experiences fueled my interest in the relationship of food, health, and opportunity. I began to
research the degree to which fresh produce is available to our most vulnerable inner-city residents. Over time, the study topic became clearer and eventually emerged as a vision for improved fresh produce access in high-risk neighborhoods within the city in which I live, Indianapolis. The outcome of the research became a framework for the City, whereby the parks department, along with partners, can sustainably grow and provide fresh produce to high-risk neighborhoods.

In addition to having a personal connection to this project, I sought to develop work that was a product of collaboration, not just my own opinion. Along the way, I had a diverse support group of instructors, classmates, stakeholders, advisors, and colleagues; all of whom influenced my direction and helped shape the process, as well as the content of my study. As the framework evolved and as discussions intensified, the project turned into a shared vision between the university research team, the parks department, the parks department fundraising foundation, and an initial donor. This collaboration was an exciting addition to the work. The group sought to not only honor existing relationships, but explore ways to expand the coalition.

I believe that this collaborative approach to a shared vision is a glimpse into how we will increasingly practice post-recession; emphasizing economy and community through partnerships and shared vision. And though the study itself relates to a specific topic, I now realize that I have achieved the broader goals set out at the start of this journey. I have discovered a more dynamic and collaborative process and the possibility of an integrated scholarly and professional approach to work. These personal discoveries will have lasting influence on my future work.
Research Methodologies
The outcome of this study is a framework for improving health through increasing the availability of fresh produce to high-risk neighborhoods within the city of Indianapolis. The study includes mixed methods of research: spatial, quantitative, qualitative, precedent, and literature review. Below is a detailed research approach to the study, organized by 1) research defining the problem, 2) research defining the opportunity, and 3) research defining the framework. Throughout each step, a diverse blend of research methods is used.

**Research Defining the Problem**

A series of literature reviews was conducted to develop an understanding of the three primary problems: food insecurity, food availability and the food environment, and chronic illness. To enrich the study and provide a broader context, secondary problems/issues have also been explored through literature review. Secondary issues include connectivity, land use, open space, our healthcare system, the agricultural economy, and diet and fitness recommendations.

Upon completion of the literature review of primary problems, it was possible to identify, through spatial mapping, high-risk areas within the City. Need and risk were defined by a number of research-based indicators related to food insecurity, fresh produce access, and chronic illness. Each indicator was categorized as relating to one of the three primary problems and then spatially mapped throughout the City by census tract in ArcMap GIS software. Individual indicators for each primary problem were then
overlaid to yield a composite map for each primary problem. On each of these three maps, high-risk areas (census tracts) were identified as places where a number of indicators overlapped. The three maps were then overlaid with one another to define high-risk areas throughout the city. In this final overlay, high-risk areas (census tracts) were defined where a number of high-risk areas (as defined by the three primary problem maps) overlapped with one another.

**Research Defining the Opportunity**

Additional literature review was necessary to understand how to address problems. This research was both broad for contextual purposes, yet also narrow in focus to inform the framework. The broad, contextual research studied secondary issues and explored urban design for physical activity, as well as the general food environment, and urban food systems. The more narrowly-focused research, sought to understand urban agriculture interventions that were directly relevant to the primary problems. Here, the literature review included precedents, best practices, and peer-reviewed research. A scan of places (cities, neighborhoods, districts) and interventions (urban farming, community gardening, backyard gardening) focused particularly on integrated and sustainable solutions. In pursuit of Indianapolis-specific information that would inform the framework, quantitative and qualitative data was gathered through a post-occupancy evaluation of Indy Urban Acres Farm.

**Research Defining the Framework**

Through questionnaires given to leading urban agricultural organizations, qualitative and quantitative information was gathered about their mission and operations. With this
information, an operational framework emerged to include recommendations for land
tenure, revenue sources, expenditure types, staffing and support, educational and
outreach programming, food distribution, and agricultural production. Spatial mapping
(using ArcMap GIS software) of potential “green locations” included physical
characteristics, as well as cultural resources. Locations were first evaluated for physical
caracteristics: land use, population density, public transit and arterials, rail lines and
high-speed roadways, parks and open space, city-owned vacant lands, and trails and
greenways. Second, cultural resources were overlaid: schools, community centers,
pantries, farmers’ markets, and libraries. When overlaid, the two maps indicate ideal
“green locations”.

Throughout this phase of the work, the project stakeholders (Indianapolis
Department of Parks and Recreation, Indianapolis Parks Foundation, Indy Urban Acres
Farm, and IU Health) have been engaged. Their collective input has guided the project
according to shared goals. Through team discussions, important limitations have also
become known and have shaped this study to respond to the difficult economic realities
facing the City.
Conclusions
With Indy Urban Acres, the City of Indianapolis, through its Department of Parks and Recreation, has demonstrated a commitment to participating in mission-based urban farming. In just its first year, the urban farm produced over 120,000 one-cup equivalent servings and distributed the harvest free to residents in need of fresh fruits and vegetables. Beyond growing produce, the farm was also host to hundreds of visitors and benefited from thousands of service hours; volunteered by neighborhood residents and employees at well-known institutions across Indianapolis. Workshops were also held, to teach children about gardening and introduce them to fruits and vegetables that they may not get at home or school. This awe-inspiring act of community comes at a time of great economic hardship – felt by families and the City as well – making the initiative that much more admirable.

Photograph 1:  Crops at Indy Urban Acres during the fall of 2012
As we turn the page on Year One and look toward the farm’s second year of operation, Indy Urban Acres administrators are buoyed by the first year successes. Hoophouses were constructed over the winter and plans are in the works to add a farm intern for this coming season. Discussions about new and different crops are ongoing. Through the second season and beyond, Indy Urban Acres is poised to leave a legacy on the surrounding neighborhood.

The successes of the farm can lead one to imagine years of future operation and even replicating the model in other parts of the City. But in order to do so, the City and its current and potential partners must consider their roles and how to best sustain a program. It is within this framework that the City can seek to accomplish the same community-building initiative of Indy Urban Acres in other neighborhoods across Indianapolis.

An Overview of the Framework

The framework proposed is a synthesis of the literature indicating multiple benefits to individual and community health resulting from urban agriculture; the Indy Urban Acres first year evaluation; and case studies and precedents. Through that synthesis, the framework includes three major areas of focus: City Participation, Garden and Farm Typologies, and Green Locations. The last of the three, Green Locations, is the term given to describe where initiatives could be located across the City if expanded. These locations are studied within the context of Target Areas that are defined in this study as a computational mapping of risk indicators for: chronic illness, food insecurity, and food availability/environment.
City Participation

The framework recommends that the City start with adopting a Food Charter and establishing a Food Policy Council. Through those efforts, the City will make a formal and declarative statement about the importance of food and will put into place a group that can best shepherd food policy into the future.

The framework also calls upon the City to support initiatives through providing land, infrastructure, and capital improvement. In some cases, organizations are recommended to lead initiatives. As City partners, organizations can be for-profit, or not-for-profit, but they must be mission-based and focused on providing fresh produce for neighborhood residents, as well as programming elements of education, outreach, and training. It is recommended that the City also assist by providing necessary tools, seeds, and basic gardening training.

Garden and Farm Typologies

The framework focuses on two typologies: Farms at Community Scale and Gardens at Neighborhood Scale. The two typologies are distinguished by the group leading the initiative and the programmatic elements that may be incorporated as part of the initiative. Programmatic elements include neighborhood education, outreach, and training. Examples include classes (cooking, gardening, fitness, healthy eating, budgeting, and shopping), workshops, events, produce stands, farm field trips, farm tours, youth and adult internships, and community garden plots.

Farms at Community Scale are recommended to be led by organizations and include an intensive programming element. Food grown here is recommended to be distributed to the neighborhood, either donated, purchased, or a combination thereof. These farms will likely be larger capital improvement projects requiring some assistance
from the City. In addition to land for growing produce, the project may include buildings, parking areas, paths, and gathering areas.

Gardens at Neighborhood Scale are proposed to be led by residents, neighborhood groups and will likely be absent of programming elements. These initiatives may be similar to those under the City’s Community Gardening program. In this framework, the food grown at the garden is intended for neighborhood consumption. The implementation of the garden is likely to involve neighborhood residents and volunteer efforts and may be more a product of donated and recycled materials than of new materials.

*Green Locations*

Within this framework, a handful of Farms at Community Scale test sites are recommended. These sites, called Green Locations are proposed in Target Areas and align with criteria of Physical Infrastructure and Community Resources.

Physical Infrastructure is noted as those elements inherent to a City’s urban fabric. Contributing elements of Physical Infrastructure include well-connected roadways, presence of sidewalks, residential land use, high population density, availability of transit, trail and greenway presence, and good site visibility. Rail lines, high speed roadways, and depressed waterways can be barriers to mobility.

Community Resources are the social institutions that tie neighborhoods together. These can include community centers, food pantries, day care centers, schools, community and faith-based organizations, and neighborhood organizing. A flaw of this study is not having the available mapping for many of these community resources. Just schools are mapped and included in this study.
Next Steps

The framework and conclusions presented herein are seen as a starting point for further study. Areas for future focus and additional study include:

- Addition of farmers’ markets to Food Availability and Food Environment Mapping.
- Year Two Indy Urban Acres food distribution surveys: to better understand if food was eaten, by whom, and how it was prepared.
- Inventory and analysis of Community Resources.
- Identification of potential community partners and organizations for Farms at Community Scale.
- Identification of a pilot Farms at Community Scale project.
The Case Study: Indianapolis
The Study Location: Indianapolis

Indianapolis/Marion County has been chosen for study in this proposal for a number of strategic reasons. Chiefly, the county’s health and physical activity statistics reflect the alarming trends identified. Additionally, as the state’s largest and most urban population center, the study area has more capacity to develop momentum towards transformative initiatives. Lastly, the City of Indianapolis has demonstrated a recent focus on these issues through recent construction and planning initiatives including: bike lanes and greenways, and community gardens and urban farms.

Historical Background

Designed to be the state capital, the City of Indianapolis was planned by Alexander Ralston, an apprentice to French architect and Washington D.C. planner Pierre L’Enfant, and Elisa Fordham. Their plan proposed a gridded one mile square plat with a center commons and four diagonal boulevards radiating to the corners. Historically, the city has been known for its automobile manufacturing industry as an inter-state transportation crossroads, hence the state motto “Crossroads of America”. More recently, Indianapolis has successfully branded itself as the amateur sports capital of the world, and has hosted the Pan American Games and numerous NCAA championships. Most recently, all eyes were trained on Indianapolis as the host city for Super Bowl XLVI.
Social, Physical, and Ecological Characteristics and Context

Indianapolis is the state’s largest population center. According to the U.S. Census Bureau, Marion County is home to approximately fourteen percent of all Hoosiers and racial and ethnic diversity in the county is higher than state averages (three times higher for Black populations and one and one-half times higher for Hispanic or Latino populations). These higher percentages indicate that disparities associated with those groups affect more people within Marion County than the balance of the state. That association indeed holds true according to CDC statistics, as Marion County health trends for chronic diseases, obesity, and overweight outpace state averages.

Figure 1: Marion County Physical Size and Population Proportional Size to Indiana

The city has a large inner-city population, though similar to other cities in the Midwest, has seen a high number of properties within urban core neighborhoods fall vacant. Industrial uses still abound in and around the urban core, and others, like the GM Stamping Plant just west of downtown lay unoccupied. The city is organized by a well-conceived grid of streets, however, a number of these have been converted to one-way pairs to facilitate rush-hour volumes. Over the years, interstates and local freeways constructed within the city have bisected and isolated neighborhoods. These high-
speed arterials designed to move traffic have become barriers to cohesive, physical connectivity, particularly for non-motorized forms of transportation.

The city is relatively flat, but undulating landform is noticeable along its numerous waterways and at the edges of the county. Waterway access and cleanliness is varied. Open space within the city is both of built and natural character. The City does not have a Food Policy Council, nor has it adopted a Complete Streets ordinance. A citywide smoking ban was recently enacted.

**Built Environment Initiatives Aimed at Health**

A possible barrier to increasing physical activity is the low proportion of outdoor recreation opportunities in Marion County. According to the 2011 American Fitness Index, relative to the top fifty metropolitan statistical areas in the U.S., Marion County falls woefully short in the present amount of parkland. Key comparisons: fifty-five percent less parkland (as a percentage of land area), twenty-six percent less acres of parkland (per 1,000 residents), sixty-five percent fewer ball diamonds (per 10,000 residents), and forty-five percent fewer recreational centers (per 20,000 residents) (American College of Sports Medicine, 2011). Economically, the City spends $46 per resident for parks; well below national average of $102 (Indy Parks & Recreation, 2009). Walk Score, whose mission is to promote walkable neighborhoods, ranks the top fifty cities based upon "walking routes and distances to amenities, road connectivity metrics such as intersection density and block length, and scores for individual amenity categories" (Walk Score, 2011). In their current rankings, Indianapolis ranks forty-fifth, matching the American Fitness Index ranking. On the positive side, the City is actively adding bikelanes, building greenways, and extending the Cultural Trail to improve recreational connectivity.
Urban agriculture has received some attention within Indianapolis. Some efforts are private or public/private endeavors, and others are City-run. For instance, the City of Indianapolis now has an Urban Gardening program focused on providing access to vacant lots and technical expertise in the establishment of new community gardens that help local communities “focus on practices that advance environmental wellbeing, economic profitability and social/economic equity” (Mayor Ballard’s Office of Sustainability, 2012). An Indy Parks and Recreation project, called Indy Urban Acres Farms, is a focus of this study. This eight-acre site and 1.5 acre organic farm on the City’s east side grows produce for donation to a local food pantry within Marion County (Indianapolis Parks Foundation, 2012). According to the City’s website, a number of other public and private initiatives are underway:

- The Capital City Garden Project - community based educational program
- Filege Hiywot Center - training youth how to garden in Metropolitan Indianapolis
- Global Peace Initiatives - active in creating peace gardens, whose yields are donated to anti-hunger initiatives
- Growing Places Indy - cultivating the culture of food and urban agriculture in Indianapolis
- Going Local - providing information on how to eat and produce food locally
- Indy Tilth - grassroots organization promoting gardening and urban sustainability
- Indy (Grows) Gardens - envisioning a community garden in every Indianapolis neighborhood

In March 2012, the Butler University Center for Urban Ecology was awarded a three-year grant to fund efforts to support urban agriculture. The University will work with community partners in Indianapolis’ food system “to connect urban ecology to urban agriculture, urban agriculture to Indianapolis neighborhoods, and Indianapolis neighborhoods to the broader foodsheds – meaning where all our food comes from” (Butler University, 2012).
Other Indianapolis-specific reports and documents consulted in this report, but not necessarily cited include:

- Food assessment for Haughville, prepared in Spring 2011 for the Food Coalition of Central Indiana by the Butler University Center for Urban Ecology
- Greening the Crossroads: A Green Infrastructure Vision for Central Indiana, prepared by the Central Indiana Land Trust and The Conservation Fund
- IndyGo Transit System, prepared in December 2010 for the Indianapolis Metropolitan Planning Organization and IndyGo by Transportation Management Design, Inc.
- Indy Greenways Master Plan, prepared in 2002
- Indianapolis Metropolitan Planning Area 2035 Long-Range Transportation Plan prepared in 2011 for the Indianapolis Metropolitan Planning Organization by Cambridge Systematics, Inc. with HNTB
- Official Thoroughfare Plan Marion County, prepared in June 2002 by the City of Indianapolis Department of Metropolitan Development, Division of Planning
- Indianapolis Regional Center & Metropolitan Planning Area Multi-Modal Corridor and Public Space Design Guidelines, prepared in August 2008 for the Indianapolis Metropolitan Planning Organization by Storrow Kinsella Associates Inc.
- Indianapolis Regional Center Design Guidelines, prepared in June 2008 for the City of Indianapolis Department of Metropolitan Development, Division of Planning, in cooperation with Ball State University College of Architecture and Planning Indianapolis Center and the Historic Landmarks Foundation of Indiana Urban Design Oversight Committee
- Central Indiana Regional Bikeways Plan, prepared in February 2012 by the Indianapolis Metropolitan Planning Organization
- Indianapolis Regional Pedestrian Plan, prepared in November 2006 for the Indianapolis Metropolitan Planning Organization by Storrow Kinsella Associates Inc.
- 2009-2014 Indianapolis-Marion County Park, Recreation & Open Space Plan
- Various Quality of Life Plans
- Various Neighborhood Plans
- Reconnecting our Waterways Initiative
An Unhealthy System
When we talk of “An Unhealthy System”, we focus on elements of health that have a relationship to the built environment and lifestyle. It is in this relationship where policy and programs can create lasting and positive changes to individual and community health. In this study, the focus is on three elements: Food Insecurity, Food Availability and the Food Environment, and The lack of healthy food access in high-risk, highly populated urban areas also represents a major challenge to reaching targeted fruit and vegetable consumption. In Indiana, one in fourteen residents lives in a census tract classified as a food desert. Most of these tracts are home to lower socioeconomic groups, which are of course more at-risk for chronic illness. Despite encouragement from advocacy groups and governments, grocery store and supermarket chains stocking fresh produce, which left the inner-cities in the latter part of the 20th century, have failed to return in substantial numbers.

Chronic Illness. Each element can be dramatically impacted by the community’s built environment and by personal lifestyle; both of which are modifiable. To understand the potential for modification, we must first understand the nature, severity, and impacts of each problem. First, we look at Food Insecurity.

Food Insecurity

The USDA Economic Research Service (ERS) ERS leads Federal research on food security relative to prevalence and impacts, as well as relationships to policies, programs, and the economy (USDA Economic Research Service, 2013). According to
the agency, food security means “access by all people at all times to enough food for an active, healthy life” (USDA Economic Research Service, 2013). Recently, the agency adopted official definitions to standardize the way in which we talk about food security. According to the USDA ERS, low food security is associated with reports of reduced quality, variety, or desirability of diet, with little or no indication of reduced food intake. Very low food security is associated with reports of multiple indications of disrupted eating patterns and reduced food intake (USDA Economic Research Service, 2012).

Effects of Food Insecurity

In the US, food security issues are typically addressed by charities and organizations that fight hunger. Feeding America is a leading hunger-relief charity focused on this work. Their mission is to “feed America's hungry through a nationwide network of member food banks and engage our country in the fight to end hunger” (Feeding America, 2013). A partner of the Indy Urban Acres project, Gleaners, is a member organization. The charity feeds an estimated 37 million low-income people annually through its emergency food assistance programs (Feeding America, 2013). The organization gathers research on food security in order to strategically address acute disparities. Through their literature review, the organization has identified key areas where food insecurity can create lasting effects on mental and physical health.

Physical and Mental Health (Feeding America, 2013)

- In adults, food insecurity has been shown to negatively affect scores on physical and mental health exams and can lead to increased risk of developing diabetes, hypertension, hyperlipidemia, and other cardiovascular risks.
- Aggression, anxiety, and poor social skills can also result from food insecurity.

Childhood Development (Feeding America, 2013)


In early childhood, food insecurity can result in negative developmental, health, and behavioral consequences.

- Stunted and delayed development, as well as learning difficulties and poorer attachment, can result from food insecurity at a young age.
- Newborn babies can suffer from low birth weight as a result of mothers lacking adequate food access during pregnancy.
- Food insecurity in children can lead to increased hospitalization, higher risk for anemia and asthma, increased problems of oral health, and a poorer physical quality of life.
- Food insecurity in children can cause a number of social and behavioral problems, including mood swings, aggression, anxiety, hyperactivity, fighting, and bullying.

**Education (Feeding America, 2013)**

- Food insecurity increases the likelihood that children will fall behind other children in academic development.
- Over the long-term, levels of development are more difficult to reach for food insecure children than for those who are not food insecure.

**Food Insecurity Prevalence and Indicators**

Statistics for national and statewide food security are kept by the USDA ERS. An annual survey is conducted as a supplement to the monthly Current Population Survey, by the Census Bureau for the Bureau of Labor Statistics (USDA Economic Research Service, 2012). County-wide or city-wide data is neither readily available nor accurate. Local hunger-relief organizations are seeking to implement a system for better understanding local food security. These organizations also note that unemployment is an even strong indicator of food insecurity than is poverty (Feeding America, 2013). Indicators listed below for low food insecurity are also seen in cases of very low food security (USDA Economic Research Service, 2012).

- **14.9%** of U.S. households were food insecure at some time during 2011.

- **5.7%** of U.S. households had very low food security at some time during 2011.

**Low Food Security Indicators (USDA Economic Research Service, 2012)**

- In 2011, rates of food insecurity for some groups were higher than national averages.
- All households with children (**20.6%**) and households with children under age 6 (**21.9%**).
- Households with children headed by a single woman (**36.8%**)
- Households with children headed by a single man (**24.9%**)
- Black, non-Hispanic households (**25%**) and Hispanic households (**26.2%**)
- Households with incomes below 185 percent of the poverty threshold (**34.5%**)

**Food Availability and the Food Environment**

Indiana’s vast agricultural system does little to support a healthier diet. Though approximately two-thirds of the state’s land acres were planted with agricultural crops in 2011 (U.S. Department of Agriculture National Agricultural Statistics Service, 2012), very
little of that was available to Indiana residents as nutritious food because approximately 80 percent of the planted crop was commodity corn and soybeans (U.S. Department of Agriculture National Agricultural Statistics Service, 2012). Ironically, for a state with such agricultural heritage, 90 percent of the $16 billion that Hoosiers spend on food is sourced from outside of the state (Meter K., 2012, p. 20). Moreover, though a new generation of farmers is interested in providing more locally-grown produce at this scale for Indiana residents, a lack of supporting prevents market entry and expansion (Meter K., 2012, p. 22).

Figure 2: Indiana’s Food Environment
The lack of healthy food access in high-risk, highly populated urban areas also represents a major challenge to reaching targeted fruit and vegetable consumption. In Indiana, one in fourteen residents lives in a census tract classified as a food desert (U.S. Department of Agriculture Economic Research Service, 2011). Most of these tracts are home to lower socioeconomic groups, which are of course more at-risk for chronic illness. Despite encouragement from advocacy groups and governments, grocery store and supermarket chains stocking fresh produce, which left the inner-cities in the latter part of the 20th century, have failed to return in substantial numbers (Food and Water Watch, March 2011).

**Chronic Illness**

Weight and chronic illness are serious issues in Indiana. Almost one-third of Indiana adolescents and almost two-thirds of Indiana adults are overweight and obese (Indiana State Department of Health and the Indiana Healthy Weight Initiative Task Force, 2010, p. Executive Summary). In 2009, diagnosed cases of diabetes plagued Hoosiers at a 12% greater rate than the national average (Thomaskutty & Dwivedi, 2011, p. 4) and in 2005, diabetes was the sixth leading cause of death in the U.S. (Centers for Disease Control and Prevention, 2008). In 2005, heart disease accounted for 26 percent of all deaths in Indiana (Centers for Disease Control and Prevention, 2008). Unfortunately, despite efforts to improve upon the number of chronic illness incidences, rates have continued to increase over the past several decades.

There is a considerable economic cost associated with chronic illness. In 2007, an estimated $218 billion economic cost, $58 billion of which was attributed to reduced national productivity, was associated with diabetes (Thomaskutty & Dwivedi, 2011, p. 2).
Diabetes-associated costs for the Hoosier state alone approach $4 billion (Thomaskutty & Dwivedi, 2011, p. 2). In 2003, the total cost of treating heart disease in Indiana was estimated at over $4 billion and is projected to increase by an additional 250 percent by 2023 (Indiana State Department of Health, 2010), even though the state’s population is projected to increase by only 8 percent during that same time period (Indiana Business Research Center, IU Kelley School of Business, 2012). As an illustration of the public impact of these costs, Indiana’s estimated 2007 Medicaid treatment costs for cardiovascular diseases alone were over $450 million (National Conference of State Legislatures, 2012). Higher incidences of diabetes in Indiana (Thomaskutty & Dwivedi, 2011, p. 12) and cardiovascular disease (Centers for Disease Control and Prevention, 2011) can be associated with lower education, lower income level, and race. Lower socioeconomic groups are more reliant on government-assisted healthcare programs, and as the Affordable Care Act is implemented, an estimated 20 million more people nationwide will be eligible to enroll in Medicaid by 2014 (Bachrach, November 2010).

Chronic diseases such as heart disease, stroke, and diabetes “are among the most prevalent, costly and preventable of all health problems.” (Centers for Disease Control and Prevention, 2008). Making healthy lifestyle choices that include eating well and being physically active greatly reduces a person’s risk for developing chronic disease (Centers for Disease Control and Prevention, 2008). In fact, even if you have no other conditions or habits that increase your risk, the chances of developing heart disease are twice as likely among inactive people compared to those who are more active (National Institutes of Health, 2006). Unfortunately, at present less than one-fifth of adolescents and just over one-fifth of adults eat recommended daily servings of fruits and vegetables, and just over two-fifths of adolescents and three-fifths of adults meet the recommended...

Figure 3: Diabetes, Body Mass Index and Lifestyles, Indiana Statistics
Overweight and Obesity and Body Mass Index (BMI)

Overweight and obesity result from a complex interaction between genes and the environment characterized by long-term energy imbalance due to sedentary lifestyle, and/or excessive caloric consumption. For adults, overweight is defined by a BMI 25-30, while obesity is defined by a BMI > 30 (U.S. Department of Health and Human Services,
2001). The risk of death from all causes, cardiovascular disease, cancer, or other
diseases increases with moderate and severe overweight for both men and women in all
age groups (Calle, Thun, Petrelli, Rodriguez, & Heath, 1999).

Elevated BMI Prevalence

- 35% of Marion County adults are overweight (United States Department of Health
  and Human Services, Centers for Disease Control and Prevention, 2013)

- 32% of Marion County adults are obese (United States Department of Health and
  Human Services, Centers for Disease Control and Prevention, 2013)

- A 2012 study projects the adult obesity rate in Indiana to reach 56% by 2030 (Trust
  for America’s Health, September 2012). If this projection holds true, 58% of Marion
  County residents would be obese in 2030.

- 22% of Marion County children are overweight (Gibson, September 2008)

- 18% of Marion County children are at risk of becoming overweight (Gibson,
  September 2008)

Economic Cost of Elevated BMI

- A 2006 IUPUI study (Indiana University School of Public and Environmental Affairs,
  2006) estimated that $8 to $19 billion could be saved if overweight Hoosiers could
  lose 10% of their weight and keep it off over the course of their lifetime. Since that
study, overweight and obesity rates have risen by 7.3% and health care costs have risen sharply.
- Using 2010 population statistics, this equates to $1.11 to $2.72 billion annual potential savings in Marion County.

*Diabetes and Related Illness*

Common complications with diabetes include heart disease, stroke, hypertension, vision problems, kidney disease, nervous system disease, amputations, dental disease, pregnancy complications, depression, biochemical imbalance, susceptibility to infection (Thomaskutty & Dwivedi, 2011). Those of certain racial or ethnic descent are more at-risk for developing diabetes, as are those with a family history of diabetes, and individuals who are overweight or engage in limited physical activity (Indiana State Department of Health, 2004). Lifestyle changes coupled with weight loss of 5-7% has been shown to reduce the risk of onset of type 2 diabetes by 58% (Thomaskutty & Dwivedi, 2011).

*Diabetes Prevalence, Mortality, and Disparities*

- In 2010, the diabetes rate in Marion County was 11.2%, a 12% increase from the 9.8% reported in 2009 (United States Department of Health and Human Services, Centers for Disease Control and Prevention, 2013)
  - Diabetes was the 6th leading cause of death in Marion County in 2005, consistent across most racial and ethnic groups in Indiana. Among black residents, it was the 4th leading cause of death. (Gibson, September 2008)
  - Non-Hispanic black adults are 150% more likely to have diabetes non-Hispanic white adults (Thomaskutty & Dwivedi, 2011).
  - Compared to the state average, prevalence is increased in those ages 55-64 by 192% and by 240% for those over age 65 (Thomaskutty & Dwivedi, 2011).
There is a 214% increased prevalence of diabetes among adults with less than a high school diploma compared to those with a college degree (Thomaskutty & Dwivedi, 2011).

Prevalence was 225% higher in households earning less than $15,000 annually than those that had a yearly income of $50,000 or higher (Thomaskutty & Dwivedi, 2011).

**Economic Cost of Diabetes**

- The average annual health care cost for a person with diabetes in the United States is $11,744, compared with $2,935 for a person without diabetes (Thomaskutty & Dwivedi, 2011).
- 1 out of every 5 health care dollars spent in the United States is spent on caring for an individual with diabetes (Thomaskutty & Dwivedi, 2011).
- The total estimated cost incurred by the state of Indiana approaches $4 billion (Thomaskutty & Dwivedi, 2011).
- Using current population statistics, this cost equates to $552,000,000 in Marion County alone.
- Put into perspective, this is equivalent to 53% of the introduced 2013 Indianapolis City/County budget.

**Cardiovascular Disease (CVD)**

Cardiovascular disease (CVD) is a group of diseases that affect the heart or blood vessels, including those in the brain (Indiana State Department of Health, 2012). Overweight and obesity lead to increases in the risks of coronary heart disease and stroke; 21% of all Ischaemic heart disease is attributable to BMI over 21 (World Health Organization, 2002). Diabetes is also tied to CVD and is a major risk factor for negative CVD outcomes (Indiana State Department of Health, 2012). Steps to take to prevent or manage heart disease and stroke include: eat a healthy diet, participate in regular physical activity, and maintain a healthy weight (Indiana State Department of Health,
Studies have indicated that fruit and vegetables can protect against cardiovascular disease and vegetables have been negatively associated with stroke (Ness & Powles, 1997).

**Cardiovascular Disease and Stroke Prevalence, Mortality, and Disparities**

- Mortality rates for both heart disease and stroke have declined over time, but are still responsible for almost 1 in 3 Indiana deaths (Indiana State Department of Health, 2012).

- In 2005, heart disease and stroke were the 2nd and 4th leading causes of death in Marion County (Gibson, September 2008).

- In 2010, almost 5% of adults in Marion County responded that they have been told they have coronary heart disease, and 4% have been told they have suffered a stroke (United States Department of Health and Human Services, Centers for Disease Control and Prevention, 2013).

- In Marion County in 2005 years of potential life lost was almost 10,000 years for heart disease and over 2,000 years for stroke (Gibson, September 2008).

- Prevalence of coronary heart disease (CHD), heart attack, and stroke typically increase with age (Indiana State Department of Health, 2012).

- Higher income and educational levels were associated with lower prevalence of CHD, heart attack, and stroke (Indiana State Department of Health, 2012).

**Economic Cost of Cardiovascular Disease and Stroke**

- In 2010, heart disease and stroke accounted for 12.0% of all emergency department visits and 7.0% of all in-patient hospitalizations in Indiana (Indiana State Department of Health, 2012).
In 2003, the total cost (direct and indirect) of treating heart disease in Indiana was estimated at $4.15 billion, while that for stroke was $1.3 billion (Indiana State Department of Health, 2011).

Using current population statistics, this cost equates to $752,100,000 in Marion County alone.

Put into perspective, this is equivalent to 72% of the introduced 2013 Indianapolis City/County budget.

If current trends in Indiana continue, the annual cost of heart disease and stroke is projected to be $10.6 billion and $2 billion, respectively, by 2023 (Indiana State Department of Health, 2011).

Cancer

Cancer is a group of over 100 diseases characterized by abnormal cells that grow out of control and invade normal and healthy tissue (American Cancer Society, 2012). Though there are many types of cancers, and their ultimate origins are rarely understood, cancer risk can be reduced. It is estimated that out of the over 500,000 annual deaths related to cancer, one-third of these are linked to “poor diet, physical inactivity, and carrying too much weight” (American Cancer Society, 2013).

Cancer Prevalence

In 2011, 33% of all cancer deaths in Indiana were related to overweight or obesity, physical inactivity, and/or poor nutrition, and thus could have been avoided (Indiana Cancer Consortium, 2012).

Using 2008 mortality rates (Indiana Cancer Consortium, 2008), this equates to 564 avoidable deaths in Marion County alone.
Low fruits/vegetables intake is estimated to cause 19% of all gastrointestinal cancer (World Health Organization, 2002).

In Marion County alone, colorectal cancer, a type of gastrointestinal cancer accounts for 10% of all cancer incidences and 9% of all cancer mortalities (Indiana Cancer Consortium, 2008).

**Economic Cost of Cancer**

- Using 2008 population statistics, this equates to $139,440,000 annual spending in Marion County.
- Put into perspective, this is equivalent to 13% of the introduced 2013 Indianapolis City/County budget.


- Using 2008 population statistics, this equates to $381,045,000 annual spending in Marion County.
As the literature shows, physical activity and a healthy diet decrease risk of chronic disease. The recommended levels of physical activity are just 60 minutes a day for children and 150 minutes a week for adults, plus muscle strengthening exercises (U.S. Department of Health and Human Services, 2006). Exercises can include simple and free activities such as brisk walking or jogging, and pushups, sit ups, yoga, and heavy gardening (U.S. Department of Health and Human Services, 2006). Activities can be recreational in nature and performed for its own sake, such as enjoying a walk around the block, or can be utilitarian, and performed for a primary purpose other than the activity itself, such as walking to work (Sallis, Millstein, & Carlson, 2011). So even for those populations that do not have access to or cannot afford health club memberships, recommended daily levels of activity can be achieved close to home if their neighborhood includes supporting infrastructure.

As part of their ChooseMyPlate campaign, the US Department of Agriculture provides a sliding scale of recommended servings per day and week based upon age and gender (United States Department of Agriculture, 2011). Recommended amounts can be difficult to understand because vegetables are separated into five different categories; however, the rule of thumb is to fill half of your plate at each meal with fruits and vegetables (US Department of Agriculture, 2013). One might expect that recommendation to be generally achievable to those with access to fresh produce. However, as previously noted, many low status socioeconomic groups do not enjoy access to supermarkets and grocery stores.
In strong support of healthier lifestyles, Healthy People 2020, the nation’s published health objectives, lists eleven objectives for improving health through diet and physical activity (Healthy People 2020). Of those, four directly address the need for improved food security and access to fresh fruits and vegetables, and seven relate to increased levels of physical activity. Interestingly, this recent version of Healthy People also includes three developmental objectives that seek to increase the proportion of bicycling and walking trips, and promote legislative policies for the built environment that enhance access to and availability of physical activity opportunities. This document is a key reference for many federal grants that aim to improve our health. Grant dollars are often tied to efforts that attempt to achieve these objectives.

The nation’s new healthcare law, the Affordable Care Act is causing a fundamental shift in how healthcare providers deliver care. The additional numbers who will be eligible for Medicaid and the associated burden on resources will alter the focus of healthcare from treatment to prevention. As Baptist Health South Florida CEO Brian Keeley points out, “Primary and preventive care are the best ways to treat the uninsured and less fortunate in our community who often don’t seek medical care. In our system alone, it saves millions of dollars for patients, insurers, and the government by avoiding costly and unnecessary emergency room visits and hospital admissions” (Horowitz-Bennett, 2012). Sarah Havens, of Gundersen Lutheran in La Crosse County, Wisconsin claims: “We can impact healthcare costs by creating a healthier culture.” She continues, “Also, as we look at different ways of delivering healthcare, we need to be looking outside the walls for opportunities to deliver screening, education, and services as effectively and efficiently as we can, while keeping care patient-centered and community-focused” (Horowitz-Bennett, 2012). Encouragingly, within Marion County the new strategy is evident. “We focus on keeping people well in the first place. There is not
enough money in the world to treat all of the people who get sick. We want to help people make choices that make it less likely they will ever end up in the hospital,” Lisa Harris, CEO of Wishard Hospital in Indianapolis (Meter K., 2012, p. 146). IU Health, also in Indianapolis, provides an innovative mobile produce delivery service in low-income neighborhoods called “Garden on the Go”. The program offers subsidized produce and the Hospital claims that the program’s customers report an eighty-three percent increase in the amount of produce eaten (Horowitz-Bennett, 2012).

**Physical Activity and Urban Design**

The health benefits of physical activity are clear, and can include improved cardiorespiratory and muscular fitness, bone health, cardiovascular and metabolic health biomarkers, and favorable body composition (Centers for Disease Control and Prevention, 2011). Moreover, there are significant additional benefits for adults aged 65 years or older (Centers for Disease Control and Prevention, 2011). Depending on age and gender, different levels and types of physical activity are recommended, however, a great deal of this can be accomplished through ordinary outdoor activities such as walking, jogging, or even gardening (Centers for Disease Control and Prevention, 2011).

Though much of the physical activity needed to meet recommendations can be accomplished through normal, outdoor activities, the design of our cities plays a large role in that possibility. Mixed land use, residential density, street connectivity, transit access, pedestrian accommodations, and park space all factor heavily in the possibility of physical activity in the built environment. A connected grid of streets encourages more routes through neighborhoods, and results in shorter distances between destinations. Unfortunately, many inner-city neighborhoods are home to high-speed
freeways, the planning of which destroyed a vast amount of street connectivity and pedestrian infrastructure. However, though infrastructure investment has historically tended to focus to a great degree on the automobile, “recent high-level commitments by the U.S. Department of Transportation to provide more support for nonmotorized transportation options offer hope for increase in safe routes to school, trails, bicycle routes, transit options.” (Dannenberg, Frumkin, & Jackson, 2011).

Communities that support multimodal transportation programs of transit, walking, and bicycling are associated with improved physical and environmental health, thus reducing risk for chronic disease (Jackson, 2011). Residential density generally “supports local retail and may provide modeling, social support, and perceived safety that encourage physical activity” (Sallis, Millstein, & Carlson, 2011). A neighborhood’s “walkability index” can be measured and used as a tool to correlate anticipated amounts of physical activity (Sallis, Millstein, & Carlson, 2011). And though low socioeconomic status groups are more likely to reside in highly-walkable areas, they are also more likely to live in neighborhoods with greater crime rates, higher automobile traffic, and low social cohesion (Sallis, Millstein, & Carlson, 2011). These factors can influence willingness to participate in physical activity within the neighborhood.

Disparities found in risk for chronic disease are also found in the number and unequal distribution of parks, trails, and playgrounds in communities with low to medium socioeconomic status groups (National Recreation and Park Association, 2011). Also notable is that availability to and condition of parks facilities impact their use (National Recreation and Park Association, 2011). These three factors of number, distribution, and condition are important to consider in the built environment-health discussion because proximity to and number of parks facilities have been shown to increase levels of physical activity (National Recreation and Park Association, 2011). Theoretically,
equal distribution and access to green space might result in increased activity levels, and increased activity levels lower risk for chronic disease.

In order to adequately plan for parks, it is important to understand the number, distribution, and types of facilities within parks that result in higher user activity levels. According to the National Recreation and Park Association, sufficient distribution of parkland in urban areas ranges from 6 to 19 acres per 1,000 residents. Those facilities that promote increase physical activity include: playgrounds, sports facilities, and trail, and wooded areas (National Recreation and Park Association, 2011). It should be noted that parks located within walking distance to residents are critical to their use. One study noted that those living within one-quarter mile of a park were the biggest group of frequent users at forty-three percent, but that number fell to thirteen percent for those living one-half mile away from the same park (Sallis, Millstein, & Carlson, 2011). The same phenomena can be seen with trail use, as for every one-quarter mile increase in distance from a trail, its use was forty-two percent less likely (Sallis, Millstein, & Carlson, 2011). It should be noted that “walking distance” must be understood through analysis of actual walking patterns. Many studies, including those included herein as precedents, choose to measure distance from parks via a radius. These types of methodologies do not account for physical barriers such as high-speed roadways, lack of pedestrian facilities, or unsafe areas. To truly plan for equal distribution of parks, the physical context must be considered.

Park condition, safety, and aesthetics are important factors in both visitation and use of parks. Parks that are well maintained and that include safe facilities and attractive environmental features see more use (National Recreation and Park Association, 2011). Objective safety (actual crime) and perceived safety (graffiti, garbage, and vandalism)
are also determinants in the use of parks (National Recreation and Park Association, 2011).

Recent recommendations from the Centers for Disease Control and Prevention have now begun to recognize the important role of urban planning design in affecting health. The Center has published a number of recommended strategies to increase physical activity in the community. Those include: creating enhanced access to places for physical activity combined with informational outreach activities; street-scale urban design and land-use policies and practices that support physical activity in small geographic areas, generally limited to a few blocks; community-scale urban design and land-use policies and practices that support physical activity in larger geographic areas, generally several square kilometers; active transport to school interventions to encourage and support youth to engage in active transportation; and transportation policies and practices that encourage active transport (Centers for Disease Control and Prevention, 2011).

**Fact:** Just 45% of Marion County adults can claim to get 30+ minutes of moderate physical activity five or more days per week, or vigorous physical activity for 20+ minutes three or more days per week. Only 29% can claim 20+ minutes of vigorous physical activity three or more days per week (Centers for Disease Control and Prevention, 2012)
The General Food Environment and Urban Food Systems

There are many wonderful benefits to eating a healthy diet high in fruits and vegetables. Those associated with health include decreased risk of heart disease, stroke, high blood pressure, diabetes, and some cancers (Centers for Disease Control and Prevention, 2011). Healthy eating seems straightforward; the new MyPlate guidelines from the USDA recommend that people fill half their plate with fruits and vegetables (United States Department of Agriculture, 2011). (The actual guidelines are much more complicated and include weekly recommendations encompassing different serving sizes from five different vegetable groups, variable by age and gender.) However, in our food environment can make healthy eating much more challenging.

Studies indicate that neighborhood residents with better access to supermarkets and other retail stores that provide access to healthful food products and limited access to convenience stores, which oftentimes do not stock fresh produce, tend to have healthier diets and lower levels of obesity (Larson, Story, & Nelson, 2009, p. 75). However, as previously noted, many low-income, high-risk populations do not have adequate access to such facilities. Despite encouragement from advocacy groups and governments, grocery store and supermarket chains, which left the inner-cities in the latter part of the 20th century, have failed to return in substantial numbers (Food and Water Watch, March 2011). This strategy has left vast areas of the inner-city without convenient access to fresh fruits and vegetables, which is especially critical in these communities due to the underlying transportation challenges and eroded family structure (single-parent households), both of which complicate the ability to make frequent trips to a far-away grocery store or supermarket. Given a customer base that goes unfulfilled, it’s unreasonable to suggest a sudden re-introduction of supermarkets and grocery
stores in substantial numbers within these food deserts. Other strategies must be considered.

The perplexing irony of Indiana’s food import deficit and capacity to grow is not lost on a multitude of people throughout the state advocating for a sea change in our food system. These visionaries are seeking a return to our previous food systems which have disappeared over the past three to four decades with the rise of agribusiness and the growth of interstate highways (Food and Water Watch, February 2011). Prior to that shift, a regionally-based food system supplied consumers with regional food through a network of producers, processors, and distributors (Food and Water Watch, February 2011). Those networks have since disappeared.

Despite that loss, opportunities abound to provide more nutritious food to our residents. In fact, throughout the country and the state, a groundswell of effort is underway. Year after year, we continue to see the rise in numbers of co-ops, farmers’ markets, community gardens, urban farms, community-supported agriculture (CSA), low-income assistance programs, and farmer sales direct-to-consumer (Martinez, et al., May 2010, pp. iii-iv). However, as strong as those individual efforts are, many currently do little to reach the most at-risk populations and comprehensive citywide strategies are unclear.

In Chicago, an urban agriculture advocacy coalition (Advocates for Urban Agriculture), suggests multiple urban agriculture typologies as part of a comprehensive strategy. Among these are home gardens, community-based gardens, and commercial gardens/urban farms. Though community gardens are important, and the City of Indianapolis promotes them for advancing “environmental wellbeing, economic profitability and social/economic equity” and for creating a sense of community, most community gardens in the urban sense are often limited in the amount of residents that...
they can reach. Given the inherent grassroots nature of community gardens, individual gardens can be vulnerable to varying resident and volunteer interest and participation, overall program/growing success, and the effectiveness of a well-organized leadership structure. During an interview this March, Mary Corboy, director of the pioneering initiative Greensgrow in Philadelphia, Pennsylvania noted the surprising number of forgotten community gardens in Philadelphia, and are now left to become weed patches (Corboy, 2012). Even given those challenges, community gardens are an important community-building tool that also raise awareness about our diets and reconnect residents to the practice of planting and cultivating their own produce.

The more intensive urban agriculture typologies of commercial farms and urban farms often serve multiple purposes by transforming underutilized urban land (vacant lots/abandoned sites/brownfields), connecting residents to food and land, providing nutritious alternatives in the food diet, and creating a sense of community through participation. When these efforts are multiplied and thought of as a local system, a number of resulting benefits can span environmental, social, and economic platforms. Environmentally, energy and emissions savings can be realized through shortened transport distances, micro-climate and CO₂ soil balance can be improved, greater biodiversity can be achieved, and wastes can be reused as compost (Toronto Food Policy Council, 1999, p. 7). Socially, locally-based food production systems can provide employment to local residents and improve the function and appearance of blighted urban areas (Toronto Food Policy Council, 1999, p. 7). Economically, locally-produced food represents reinvestment within the community and can begin to reverse food import deficits, reduce dependency on external influences, and safeguard against volatile price fluctuation that can result from external influences.
Urban farms are popping up throughout the country and are much-celebrated because of their efforts aimed at employing local residents and providing fresh, nutritious food to our most vulnerable, low-income populations that lack that type of access. Examples of urban farms with this type of mission include: The Food Project in Lincoln, Massachusetts, Soil Born Farms in Sacramento, California, City Slicker Farms, in Oakland, CA, and Growing Power, in Milwaukee, Wisconsin, (Christian, 2010). Though their effectiveness at delivering upon their mission is notable, many urban farms rely heavily on volunteer labor, grant funding, and donations (Christian, 2010); a financially unsustainable model that is susceptible funding extensions and changing levels of giving. This financial structure can be limiting, and only a few market-driven models exist. In order to stay economically viable, one such group, Greensgrow in Philadelphia has diversified its early focus. Initially begun in a “food desert” as urban agriculture for neighbors, the fresh produce offerings did not appeal to enough in their neighborhood. The group still starts fruit and vegetable seeds for resale and now operates a CSA, but has shifted their focus to also include an on-site nursery, because the neighbors prefer to buy plans (Corboy, 2012).
The Greensgrow example illustrates the complexities of urban agriculture, where intentions may be good, but community buy-in, acceptance, and support may be disappointing, particularly if the group is seen as an outsider or if the neighborhood culture resists change. And beyond the social complexities, the new generation of farmers who are eager to supply locally-produced food to residents, higher education institutions, hospitals, city and county school corporations, local and state governments, and grocers are met with logistic and equipment. Coming between the farmers’ desire to supply and the consumers’ demand for local food is a lacking infrastructure that prevents market entry and expansion. Most notably, smaller farm equipment, green energy, greenhouses and hoop houses, warehouses, freezers and cold storage, processing facilities, distribution networks, and knowledge are all needed (Meter K., 2012, p. 22). These efforts, along with marketing and selling products, take time and pull farmers away from what they do best, which is to produce. Additionally, small-scale farmers do not have the means or time to perform rigorous and costly food safety standards/audits, which can be necessary to supply to larger-scale customers (Meter K., 2012, p. 79). Growers are overcoming these obstacles by banding together to share costs and efforts associated with these obstacles. The Alliance, formed by This Old Farm in Darlington, Indiana, is an example of more than twenty growers sharing in processing, marketing, and distribution (This Old Farm, 2012).

Though many infrastructure, financial, and logistical obstacles exist in bringing locally-produced food to larger segments of inner-city, vulnerable populations, a new model is emerging. This model, called a food hub, combines aggregation/distribution facilities with supply chain logistics such as coordinating with distributors, processors, and buyers. Food hubs also provide permanent facilities for food storage, light processing, packaging, palletizing, and marketing under the hub’s label. Other possible
services include on-site food production, wholesale and retail sales, and community-oriented space and programs (Know Your Farmer, Know Your Food Regional Food Hub Subcommittee, May 10, 2011). It appears that food hubs combine the best of what works from small rurally-based farms, urban farms, community gardens, community markets, and product processing and distributing into a central facility. Given the single-source nature of these facilities, it is understandable that the number of food hubs around the country is quickly growing. In fact, as of July 2011, more than 100 food hubs were identified by the USDA Agricultural Marketing Service (U.S. Department of Agriculture Agricultural Marketing Service, 2011). Even more encouraging, forty percent of these were established by entrepreneurs taking the organizing lead (Know Your Farmer, Know Your Food Regional Food Hub Subcommittee, May 10, 2011), suggesting the reality of consumer demand and the belief in this system as a viable solution. Equally discouraging, however, is that according to the USDA Agricultural Marketing Service, no food hubs presently exist in Indiana.

Two food hubs are worth mentioning here. The first is Detroit Eastern Market in Detroit, Michigan. According to the Market’s website, “the market and adjacent district are rare finds in a global economy – a local food district with more than 250 independent vendors and merchants processing, wholesaling, and retailing food” (Detroit Eastern Market, 2012). This hub is of a larger scale, and its success is widely recognized. In Charlottesville, Virginia, the simply named Local Food Hub is of a smaller scale. According their website, “Local Food Hub is a nonprofit organization working to strengthen and secure the future of a healthy regional food supply by providing small farmers with concrete services that support their economic vitality and promote stewardship of the land” (Local Food Hub, 2012). This hub operates a small farm and also aggregates food from over fifty small farms within 100 miles of Charlottesville. They
then sell and distribute food to individuals, hospitals, schools, and institutions. They also partner to provide food to low-income residents and donate 25% of all food to food banks. Though established just three years ago as a non-profit, this group anticipates being at a break-even point within the next two years, proving that food hubs can be financially viable.

In concept, multi-faceted, entrepreneurially-based food hubs hold promise for our inner-city areas. These facilities have the potential to improve access to fresh, locally-produced food, serve as source for local resident employment, re-claim underutilized lands, and be based upon an economically sound model.

Taking this notion a step further, the Wholesome Wave Foundation’s Healthy Food Commerce Initiative advocates for the integration of businesses, social services, and safe public spaces within food hubs. These “healthy food hubs” can also include health services, playgrounds, fitness centers, gardens, and house community programs. This wider integration of community-based uses implies a smaller-scale facility that has a deeper

Photograph 3: Local Food Hub in Charlottesville, VA
connection to individual neighborhoods. This model, if made economically sustainable, could become a local source of employment and reinvestment. These hubs could be proposed on underutilized lands directly and/or at popular transit stops. The social, environmental, and economic benefits could be transformative. One could imagine that the scale of these facilities might be optimized for neighborhoods, yet still connected to a centralized aggregation, distribution, and processing facility. One could also imagine an entire network of these facilities linked together in an effort to optimize operations and food diversity.

The strategy of reinvesting within local economies must be considered alongside food and fitness initiatives. It is a strategy that seeks to value the purchasing power that neighborhoods inherently have, even if a majority of the residents rely on government assistance programs. In these neighborhoods, income is available and goods and services are purchased. However, the current model in many of these neighborhoods is one dominated by national-chain fast food, gas station, and discount store establishments. These dollars leave the local economy to far-off corporate headquarters with little local return. A tool to measure this value, called Neighborhood Balance Sheets, is used by the Crossroads Resource Center. These studies demonstrate the value that exists in local economies, but is currently unrealized. According to the Center, “the Balance Sheet showed merchants their low-income neighbors held more spending power than they had believed. Moreover, the vast majority of these consumer dollars flowed away from the neighborhood” (Meter K. A., 1998). In one such study in Minnesota, it was documented that a group of neighborhoods perceived to be “welfare dependent” earned the same percentage of income from wages and salaries as all residents city-wide and that the amount paid in taxes by these neighborhoods exceeds the amount received in welfare benefits. These analyses also showed that food
purchases in these low-income communities totaled $123 million, purchased mostly from outside vendors.

Tying all of these notions together, the Centers for Disease Control and Prevention has recently published recommended community-based strategies to increase access to and improve the availability of fruits and vegetables (Centers for Disease Control and Prevention, 2011). These include: promoting food policy councils; improving access to retail stores that sell high-quality fruits and vegetables; starting or expanding farm-to-institution programs in schools, hospitals, workplaces, etc.; starting or expanding farmers' markets in all settings; starting or expanding community supported agriculture programs in all settings; supporting and promoting community and home gardens; establishing policies to incorporate fruit and vegetable activities into schools as a way to increase consumption (such activities can include gardening, agricultural education, lessons on fruit and vegetable preparation, and tasting demonstrations); and including fruits and vegetables in emergency food programs that provide hunger relief to individuals and families and include food banks, food rescue programs, emergency food organizations, emergency kitchens, food pantries, and homeless shelters.

Fact: Just 25% of Marion County adults consume five or more fruits and vegetables per day.

(Centers for Disease Control and Prevention, 2012)
The Effects of Urban Agriculture on Individual Health

As the literature indicates, much study has occurred to better understand the relationship between urban agriculture and health outcomes. However, the body of research demonstrate a great depth of study related to community gardens, but a poor breadth of study related to the more comprehensive definition of urban agriculture, which also includes urban farms, backyard gardening, etc. This is a limitation on the overall study, but does not preclude drawing conclusions from the research.

The research asks questions of both individual and community participation and outcomes. Through those questions, relationships to health, both individual and community, are posited. Because the primary question asked in this study is of larger scale farming, the application of the literature has been generalized to recognize concepts. The studies noted in this section, as well as under “The Effects of Urban Agriculture on Community Health”, represent a small sampling of the depth of literature.
that exists, but demonstrate the core concepts taken forward into the synthesis portion of this study.

Community gardening has been shown to positively impact lifestyle habits of physical activity, as well as fruit and vegetable consumption. The six studies below, conducted in various urban locations around the country, demonstrate the positive lifestyle impacts of community garden participation. The assumption in this study is that positive lifestyle changes will have a positive effect on individual health. Thus, urban agricultural activities that support positive lifestyle habits go to improving individual health.

Study 1: The Philadelphia Urban Gardening Program

This study (Blair, Giesecke, & Sherman, 1991) seems to suggest that there is a relationship between gardening and lifestyle, both in terms of diet as well as physical activity. Unknown, however, is if the origin of the relationship. Did gardeners have poor lifestyle habits prior to becoming active in the garden, or did gardeners already possess healthier lifestyle habits?

Study background

- Study included 144 gardeners, predominantly in inner city, low income areas.
- Gardeners tended to be longer-time city and neighborhood residents.
- Most important reasons identified for gardening: 21% - recreation, 17% - physical health and exercise, 14% - produce quality and nutrition.

Fruit and vegetable consumption

- Gardeners consumed healthier vegetables, significantly more frequently than controls: cole crops (cabbage, broccoli, Brussels sprouts, kale, cauliflower, pak choi and a variety of Chinese vegetables), okra, eggplant, sweet and hot peppers, summer squash (zucchini, bitter melon and chayote), tomatoes, and herbs.
- Gardeners consumed less fruits than non-gardeners, specifically citrus fruit and juice.
- Gardeners consumed less sweets and sweet drinks than did the controls.

**Physical activity**

- On average, a gardener spent 11.7 hours per week in the garden; approximately half of these hours in “heavier” work like hoeing, digging, planting or pulling weeds.

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**Study 2: Denver, Colorado**

This study (Litt, Soobader, Turbin, Hale, Buchenau, & Marshall, 2011) focused on the variation of healthy lifestyle among community gardeners, home gardeners, and non-
gardeners. The findings suggest that community gardeners consume more fruits and vegetables that either home gardeners or non-gardeners. Moreover, increased fruit and vegetable consumption is associated with higher levels of physical activity. Similar to the Philadelphia Urban Gardening Program study, a relationship is observed between gardening and lifestyle, both in terms of diet as well as physical activity. Again, unknown is the origin of the relationship. Did gardeners have poor lifestyle habits prior to becoming active in the garden, or did gardeners already possess healthier lifestyle habits?

Study background

- Study collected survey data east of a major interstate highway (I-25) bisecting the city of Denver.
- Sample included the general population and a list-based census of community gardeners.
- 9% of respondents participated in community gardening.

Fruit and vegetable consumption

- 56% of community gardeners consumed fruits and vegetables at least 5 times per day, compared with 37% of home gardeners and 25% of nongardeners.
- Compared to home gardeners and nongardeners, community gardeners consumed almost one serving more of fruits and vegetables per day.
- Analysis found that community garden participation reduced the relationship between social involvement and fruit and vegetable consumption, suggesting that community gardening accounted for significant variance, above that accounted for by social involvement.

Physical activity

- Higher physical activity levels were associated with higher consumption of fruits and vegetables.
Study 3: Flint, Michigan

This study (Alaimo, Packnett, Miles, & Kruger, 2008) looked at the effect household members participating in community gardening on other members of the household. The findings indicate a positive effect, resulting in increased fruit and vegetable consumption, as well as increased physical activity. This would seem to indicate that lifestyle habits may be transferable among household members.

Similar to the Philadelphia Urban Gardening Program study, unknown is the origin of the lifestyle habits and community gardening relationship. Did gardeners have poor lifestyle habits prior to becoming active in the garden, or did gardeners already possess healthier lifestyle habits?

Study background

- Study was conducted in Flint, MI, using 766 adults.
- Fruit/vegetable intake was measured using questionnaire items from the BRFSS.
- Of respondents with a gardener in the household: 61.5% were African American, 26.4% were white, and 12.1% were of other races/ethnicities (makeup of survey respondents was 49.9% African American, 41.2% white, 10.0% other).

Fruit and vegetable consumption

- On average, respondents with a household member who participated in a community garden consumed fruits and vegetables 4.4 times per day, as compared to 3.3 times for respondents without a gardening household member.
- Of respondents from gardening households, 32.4% consumed fruits and vegetables on average at least 5 times daily, as compared to 17.8% for those with nongardening household members.

Physical activity

- Those consuming fruits and vegetables at least 5 times daily were significantly more likely to engage in physical activity 3 or more times per week, but a connection to gardening was not studied.
Study 4: Southeastern Minnesota

This study (Heim, Bauer, Stang, & Ireland, 2011) looked at the effects of a youth-oriented gardening/education program on the home food environment. The findings indicate that educationally-oriented garden programs have a positive effect on the youth involved in the program, as well as the youth’s parents and the overall household. This study did measure baseline and outcomes to answer the question of the relationship origin. This study indicates that youth-based education and programming can be an important element of urban agriculture initiatives that seek to have a positive effect on lifestyle.

Study background

- Study conducted to determine whether school- or community-based interventions can affect change in a child’s home food environment.
- Study examined changes in the home food environment during the course of a 12-week garden-based nutrition education program for 4th, 5th and 6th graders at a YMCA summer camp.
- Children participated twice/week for 20-30 minutes per session and learned to plant, maintain, and harvest a fruit and vegetable garden.
- After each session, children were encouraged to share experiences with family and ask parents to purchase/serve produce they grew and learned about.
- Parents were encouraged to improve fresh produce availability through weekly newsletters that included helpful tips, recipes, and take-home activities.

Fruit and vegetable consumption

- 84% parents said their child talked about the garden at least once a week at home.
- 88% parents reported that their child shared information they learned about the garden with them or another family member.
- 48% parents reported that their child asked to complete the weekly take home activities from the family newsletter. Few parents reported participating in these take-home activities with their child.
- Between baseline and follow-up, parents reported a significant increase in their child asking for fruits and vegetables.
- Home availability/accessibility of fruits and vegetables significantly increased.
- Parental level of encouragement for their child to eat fruits and vegetables approached significance.
- Parental value of fruits and vegetables consumption increased significantly from baseline to follow-up.

Study 5: Southeast Toronto

This study (Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007) focused on the effects of community gardens within areas of high poverty on individual health. The self-reported data indicated increased fruit and vegetable consumption, as well as increased physical activity. Interestingly, the data also indicated the community garden as an importance place for growing culturally-appropriate food and a place for gardeners to stay mentally active. Similar to the Philadelphia Urban Gardening Program study,
unknown is the origin of the lifestyle habits and community gardening relationship. Did gardeners have poor lifestyle habits prior to becoming active in the garden, or did gardeners already possess healthier lifestyle habits? This study begins to describe how gardens can play a role in preserving and celebrating neighborhood or community culture.

Study background

- A study of community gardening health impacts in Toronto, Ontario
- Study area demographics: high rates of poverty, pronounced ethnic diversity
- Information was collected through focus group discussions and in-depth interviews.
- Community gardens identified in this study varied greatly in size and in organization.

Fruit and vegetable consumption

- Gardens played a strictly supplementary role, filling gaps in their diet. In particular, being able to grow and eat culturally appropriate foods was important to participants.
- Benefit of gardens was better nutrition and increased exercise.
- Participants spoke of eating more vegetables because of their community garden involvement.

Physical activity

- Gardeners said that their gardening helped keep them physically (and mentally) active.

The Effects of Urban Agriculture on Community Health

As the studies below indicate, community gardening has been shown to positively impact perceptions of and attachment to neighborhood. Additionally, a stronger sense of community is formed through building relationships at the garden; these relationships across age groups, race, and gender. Youth in particular are positively impacted by the social structure developed in many community gardens, possibly because such structure
is lacking at home. Community gardens can also become a reflection of neighborhood culture. The design of gardens and their location within dense residential neighborhoods can influence the degree to which participation occurs. Well-designed and well-located gardens become places to socialize, gather, hold events, and organize. They can become hubs of neighborhood activity.

Beyond the social benefits of urban gardens, financial benefits have been measured. Impacts include increased property values for surrounding homes, increased property tax revenue for cities, and decreased food costs for participants.

Study 1: The Philadelphia Urban Gardening Program

This study (Blair, Giesecke, & Sherman, 1991) finds that individuals participating in community gardening are more likely to engage in community-based social events and have a better opinion of neighbors. It is unclear whether this increased engagement and higher opinion is simply a product of personality or a product of participation in the community garden. The value in this study is that community gardening does play a role in community-building; either as an outward display of individuals’ existing personality traits or through fostering new community engagement.

Study background

- See Individual Health Study #1

Social/community aspects

- Gardeners were more likely than controls to regard their neighbors as friendly.
- Gardeners were more likely than controls to participate in food distribution projects, neighborhood cleanups or beautification projects, and neighborhood barbecues and social events.
Study 2: Denver, Colorado

This study (Litt, Soobader, Turbin, Hale, Buchenau, & Marshall, 2011) seems to suggest an association between low levels of fruit and vegetable consumption and low social involvement and low neighborhood attachment. This may not suggest that the opposite would be true, but it may hint at a broader strategy focused on neighborhood attachment; particularly when considered alongside the other major finding that high levels of perceived neighborhood aesthetics are associated with higher levels of fruit and vegetable consumption. One could posit that neighborhoods beautified through urban agriculture initiatives may result in improve neighborhood aesthetics (and increased consumption of fruits and vegetables). Improved neighborhood aesthetics may likely
result in improved neighborhood attachment, and thus increase consumption of fruits and vegetables among those with a low level of neighborhood attachment.

**Back Study background**

- See Individual Health Study #2

**Social/community aspects**

- Survey respondents who stated a low neighborhood attachment and low social involvement were associated with lower levels of fruit and vegetable consumption.
- A high level of perceived neighborhood aesthetics was associated with higher levels of fruit and vegetable consumption.

**Study 3: Flint, Michigan**

This study (Ober Allen, Alaimo, Elam, & Perry, 2008) indicates the effect of community gardening on community, particularly youth engaged in the garden. The data indicates that participants reported a higher degree of community involvement and more positive feelings toward their community. The findings show that relationships were developed among community members as a result of participating in the community garden. Additionally, a greater sense of community pride and increased feelings toward helping others in the neighborhood arose from participating in the community garden.

**Study background**

- Case study of two community gardens in Flint through participant interviews.
- Both gardens were established in 1997 in order to reduce dumping and other crimes in the neighborhood while concurrently improving the appearance of the community, providing access to free healthy food, and engaging local youth during the summer.

**Social/community aspects**

- Provided youth with a constructive endeavor to engage in, particularly during summer months when youth are more idle.
Neighborhood youth described the gardens: a source of pride, a context through which they were able to make contributions to their community, a way to help make their neighborhood a better place, and a way to help vulnerable populations like the elderly, the homeless, and the poor.

Young people involved in the garden programs helped elderly neighbors maintain their yards and property and others brought them garden produce.

Participants credited the gardens as bringing together neighborhood residents who previously shared little in common and had little impetus to interact.

Regular interactions in the garden yielded close relationships between youth and adult residents in the neighborhood, friendships among the youth, and opportunities to develop interpersonal skills.

Study 4: *Brooklyn, Bronx, and Manhattan*

This study (Saldivar-Tanaka & Kransy, 2004) appears to have broad relevance to the purpose and design of urban agricultural initiatives. First, it is noteworthy to point out that children under age 13 were most often seen in the garden, despite not gardening very often. This implies that children are particularly attracted to places of activity and socialization, and may enjoy the company of other community members found in the gardens. The design of the gardens plays a major role in their use. This study focuses on Latino neighborhoods, and describes how the garden design and garden elements respond to the neighborhood culture. Through this deliberate response, the garden becomes an activity node and a destination for events that go beyond the initially intended function of the garden as a place to grow fruits and vegetables.

**Study background**

A study of 20 community gardens and 32 community gardeners to determine the role Latino community gardens play in community development, open space, and civic agriculture.
Study included interviews with gardeners and staff from gardening support organizations, observations in the gardens, and gardener/organization/agency document review.

**Social/community aspects**

- Most active gardeners are senior citizens, followed by working adults. Though not active gardeners, children under 13 most often visit the garden.
- Garden structures, design, and plants reflect the country of origin of the gardeners and garden members.
- All 20 gardens have wood casitas, or small wooden houses that generally can accommodate no more than 10 people standing or sitting at one time, used for storage and socialization.
- Cooking facilities are present in 40% of the gardens, and all gardens have unplanted areas surrounding the casitas used for barbecues, picnics, and potlucks.
- Gardens viewed more as social and cultural gathering place than an agricultural site.
- Gardens often are created by community members, demonstrating the potential for community participation in planning and designing open spaces in neighborhoods where government funding for open spaces is lacking.
- The activities of community gardeners catalyze community organizing (fund raising, publications, workshops, rallies, outreach, and support of other local campaigns, political activism).
- Gardens are personalized, independently-created, and constantly changing “participatory landscapes”; in sharp contrast to institutionalized city parks.

**Study 5: Southeast Toronto**

According to this study (Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007), participants of community gardening reported a high degree of neighborhood involvement and attachment. The gardens are seen as safe, places to socialize, opportunities to grow and share produce, a routine destination, and as a retreat. A relationship is observed between gardening and community. Unknown, however, is if the origin of the relationship. Were gardeners inclined to have good feelings of
community prior to becoming active in the garden, or did those feelings develop after gardening began?

Study background

- See Individual Health Study #5

Social/community aspects

- Community gardens near the homes of gardeners used regularly and consistently; gardens in areas not immediately adjacent to the housing of participants not frequented as regularly.
- Gardens were most active in the evenings.
- Many growers gathered food for dinner from the garden every day.
- Gardens were spaces of retreat within densely populated neighborhoods.
- Opportunity to share grown produce was of great importance to gardeners, particularly among those with low incomes.
- Gardening was an empowering; a feeling enhanced by garden-based programming.
- Gardens thought to increase attachment to the community.
- Seen by gardeners as a place for positive social interaction.
- Gardens served as meeting places.
- Participants described a strong emotional attachment to the gardens themselves.
- Participants spoke of feeling particularly safe within their community gardens.
- Long waiting lists exist for many of the gardens.

Study 6: Analysis of Journal Articles

This literature review (Draper & Freedman, 2010) focused on U.S.-based community gardening research; fifty-five studies were reviewed. Common themes indicate that community gardens: provide a strong sense of community, are a way to bring together people of different backgrounds, can positively affect youth in many ways, including lifestyle habits, academic performance, and overall development.
Study background

- A content analysis on 55 peer-reviewed journal articles, from 1999-2010, with a focus on community gardening in the United States.
- Process included an iterative read and review process with the following considerations: population; setting; methodology; study results; and the purposes, benefits, and motivations associated with community gardening.

Social/community aspects

- Collective efficacy increased and participants viewed the community garden as a way to successfully bring together people of different races and other people who would not normally socialize.
- Studies found that the relationships formed led to a stronger overall sense of community.

Youth gardening programs and projects

- Found to produce positive dietary, academic, and developmental results.
- Found to increase and promote youth development, social relationships, respect for other individuals and cultures, and science achievement and environmental attitudes.
- Provide an effective participatory learning opportunity for youth, which led to improvements in academic performance and social skill development.
Study 7: New York City

This study (Been & Voicu, 2006) demonstrates the economic impact of community gardens on individual home values as well as city revenues. This data suggests that investment in community gardens as neighborhood stabilization and redevelopment tools is a valid approach. Moreover, that investment is paid off by significant increases in property tax revenues to the City. This data is particularly important for cities struggling with vacant property, blighted urban neighborhoods, and declining tax revenue.

Study background

- Study considered all property sales in New York City over several decades to determine effects of community gardens on property value.
- Sample includes 636 gardens, established from 1977-2000.
- Gardens were generally located in distressed neighborhoods.
- Study compared the sales prices of properties that are within designated distances of community gardens to prices of comparable properties that are outside the designated ring, but still located in the same census tract. The magnitude of this difference was then compared before and after the garden is opened.

Economic impacts

- A new community garden has a statistically significant positive impact on residential properties within 1,000 feet of the garden.
- Economic impact increases over time.
- Greatest impact seen in the most disadvantaged neighborhoods.
- Higher quality gardens have the greatest positive impact.
- Opening a garden is associated with increasing rates of homeownership, and thus may be serving as catalysts for economic redevelopment of the community.
- Lots on which gardens were eventually placed had a significant and negative effect on surrounding residential and commercial property values before garden establishment.
The gap between residential prices in the 1,000-foot ring and those outside the ring but in the same census tract narrowed after the garden was established, from an 11.1% gap to a 2.5% gap.

The fixed effect of a low-quality garden on residential property is 7.3%, but the fixed effect of a good-quality garden on residential property is twice as large.

Garden features that matter most are fencing quality/security, cleanliness, and landscaping.

**Local economic impacts (simulation)**

- The impact of a low-quality garden of typical size on the properties located in its immediate vicinity is +6.2%. As distance to the garden increases, the positive impact of low-quality gardens vanishes at around 540 feet and is transformed into an increasingly negative effect which reaches -5.3% percentage points at 1,000 feet.
- A good-quality garden of similar size is +13.9%. The positive impact of good-quality gardens diminishes with distance too, but can still be felt at 1,000 feet, with a magnitude of +2.4%.

**City-wide economic impacts (simulation)**

- In New York City, estimated property value increases generated in the 1,000-foot ring total almost $1.5 billion – or $2.3 million per garden (in 2003 dollars).
- The city gross tax benefit generated by all community gardens over a 20-year period amounts to about $563 million.
- If the City would have fully subsidized the gardens, its total investment would have amounted to about $83.5 million.
- Thus, the estimated net tax benefit would be, in the aggregate, about $480 million or over $750,000 per garden.

**Study 8: Seattle, Washington**

This study (Hoisington, Butkus, Garrett, & Beerman, 2001) looked at gleaning as a way of supplementing food purchases. It demonstrates that even when asked to harvest their own produce, participants did so to stretch their food dollars and stockpile food for
the year. The research shows that individuals are willing to participate in community
gardening as consumers of produce.

Study background

- During the 1997 season, approximately 50 gleaners participated in the Pierce County
  Expanded Food and Nutrition Education Program Gleaning Project; 29 participated
  in an intensive 4-week study to track use of produce by gleaners.
- Gleaners were allowed to pick as much produce as they needed for themselves. The
  remaining produce was donated to the local emergency food distributor.

Economic impacts

- All participants said that gleaning helped them stretch their food budget and allowed
  them to bring home nutritious food for their family.
- 55% of participants said that they were not able to get as much produce when not
  gleaning. Of this, 88% said that “there is not enough room in our budget to buy as
  much fresh produce as we would like.
- 55% of all participants felt that their family’s “healthy eating” improved from gleaning
  participation.
- Several participants said that they were able to create a year-round supply of local
  produce through preservation of gleaned produce (canning, freezing, drying, and
  pickling).

Interpretations and Relationship to the Problem Statement

The literature on physical activity, emerging urban food systems, and the effects of
urban agriculture on community and individual health indicates a strong relationship
between the problem statement and available built environment interventions. Among
these, the national health objectives and funding opportunities demonstrate the acute
need to reverse worsening health trends and address disparities through programs and
built environment initiatives that promote healthier fitness and diet lifestyles. The
spiraling healthcare costs are causing a shift from treatment to prevention, and built environment strategies led by healthcare organizations, like those seen in urban farming efforts Indianapolis, are proof. The presence of food deserts throughout the state and within Indianapolis directly affects those residents’ ability to improve their diets. The lacking infrastructure required to support small farmers wishing to provide affordable, fresh, locally-grown produce to fellow Hoosiers can be partially attributed to the state’s commodity-based agribusiness focus. The promotion of the automobile as a primary mode of transportation has contributed to the creation of physical barriers within neighborhoods and to reduced levels of physical activity.

To address the problems we face as a society, we must consider urban design solutions that improve our health. By all indications, there are many valuable individual efforts occurring throughout the country and county, but the real issue is localizing those solutions as part of a comprehensive strategy addressing our health crises through food and fitness initiatives in the built environment. We have to improve how and why we promote healthier lifestyles like walking, jogging, and enjoying more nutritious diets in our streets, our vacant lands, and around transit stops. We need to recognize that unemployed populations, underutilized land, and the lack of fresh food outlets and neighborhood recreational facilities in and around inner-city areas represents an opportunity to not just improve our residents’ health, but to build our local economies. We must recognize that investment in the built environment in ways that improve our health is not just a tool to save future healthcare dollars, but should be a critical component of each planning and implementation effort. Unique partnering models must continue to emerge between private, public, and non-governmental organizations in order to pay for built environment planning and implementation efforts. Finally, strategies should address two scales: the neighborhood scale which has specific
cultural, physical, and ecological characteristics, and the city/county scale as a linked and efficient network.

The enormity of the work ahead is incredible. It will take many years and a multitude of resources to complete. The background demonstrated here illustrates that focused thinking on particular elements is necessary to realistically and systematically address problems. This balance of this study focuses on one element: food production in cities.
Addressing the Problem
Indy Urban Acres: A First-Year Evaluation

In fall 2012, Indy Urban Acres harvested its first-ever crop. The initiative is a partnership between the Indianapolis Parks Foundation (who is providing land and infrastructure), the Indianapolis Department of Parks & Recreation (who is overseeing operations), and IU Health (the initiative’s major donor). The mission of this initiative is to support individual and community health through increasing the availability of and access to fresh produce in communities of need. This farm represents the largest, and only, effort in the city where food is grown on public land by paid staff. As such, it is an incredibly relevant example of the city partnering with other entities to increase fresh produce availability and access.

Indy Urban Acres is a central piece of the proposed framework that follows. Evaluating the initiative’s first year is a cornerstone of this study because with this information, we can compare outcomes to those of best-in-class initiatives across the country. That comparison shapes the proposed framework by informing initiative mission, management and operations, and food production. Suggestions and recommendations for initiative improvements, sustainability, and expansion are made possible through the comparison. The comparison is fully developed under “

A Comparison: Leading Urban Farms and Indy Urban Acres”.

The evaluation is based upon information a questionnaire prepared by the research team and distributed to all team members. The questionnaire is included as “Appendix 1: Indy Urban Acres Post Occupancy Evaluation Questionnaire” of this report. Responses were received from a representative of IU Health (Laura McCarthy),
representatives from the Indianapolis Parks Foundation (Lori Hazlett and Jenny Burrough), and the Indy Urban Acres farmer (Tyler Gough).

General Farm and Site Information

The Indy Urban Acres site is located southeast of the Interstate 465/70 interchange, near the intersection of 21st Street and Franklin Road on the City’s east side; the highways serve as the eight acre site’s northern and western boundaries. The surrounding neighborhood is socioeconomically challenged, thus the farm location is aligned with the initiative’s mission-based purpose. The site is approximately eight acres size, with 1.56 acres under production. A hoophouse was recently added to the farm site. The farm also has seventeen community garden plots which are eight foot square, a small shed for tools, and a small apiary used for pollination.

Photograph 9:  View of the farm looking towards the west

Figure 4:  Indy Urban Acres and Surrounding Context
A FRAMEWORK FOR A CIVIC-URBAN FARM MODEL IN INDIANAPOLIS

Addressing the Problem

The eight-acre Indy Urban Acres site (shown in red outline)
Photograph 10: The apiary

Photograph 11: Inside the farm shed

Photograph 12: Educational literature at the farm
Produce Grown

Despite record-breaking drought during the summer of 2012, the farm endured. A variety of crops were organically grown: arugula, beets, cabbage, cantaloupe, carrots, collard greens, cucumber, eggplant, green beans, kale, lettuce, mizuna, onions, okra, pak choi, peppers, potatoes, pumpkins, radishes, spinach, swiss chard, tatsoi, turnips, watermelon, winter squash, and zucchini. All combined, almost 36,000 pounds of produce was grown, the equivalent of almost 120,000 servings and a market value of over $50,000.

The data below represents the yield, expressed in pounds, servings, and market value. The pounds figure was aggregated from weekly produce harvest tickets, assembled by Tyler Gough. These tickets were categorized by fruit or vegetable type and pounds harvested. To arrive at servings, pounds were converted to edible cup servings, prepared for consumption. This conversion was unique for each type of fruit or vegetable. Within the conversion, accommodations are made to acknowledge that certain parts of fruits and vegetables are not edible, such as the rind of a watermelon (From Karen's Kitchen, 2012). For fruits and vegetables that fit this category, the inedible portions of the produce are not included in the edible cup servings figure, but are included in the pounds grown figure.

To arrive at price, data sheets were obtained from the USDA Economic Research Service (ERS). Data sheets are available for over 150 different fruits and vegetables and summarize price per pound, as well as price per edible cup serving. Price information is an average of prices at retail stores using 2008 Nielsen Homescan data (USDA Economic Research Service, 2012).
### Table 1: Indy Urban Acres Yield, Total Pounds

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Fruits</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25,242</td>
<td>10,335</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Indy Urban Acres Yield, Servings Grown

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Fruits</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>89,964</td>
<td>28,311</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: Indy Urban Acres Yield, Retail Value

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Fruits</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$50,271</td>
<td>$4,850</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Indy Urban Acres Yield, Retail Value per Serving

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Fruits</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.56</td>
<td>$0.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The evaluation of the produce grown at Indy Urban Acres includes a detailed analysis of vegetable types grown. Raw data collected from the farm was categorized into vegetable groupings. These grouping correspond to the current USDA ChooseMyPlate guidelines, which outline the amount and types of fruits and vegetables that should be consumed (United States Department of Agriculture). It is helpful to see this analysis, because if it becomes a goal of the initiative to align production with these guidelines, then we now have a baseline comparison.

Table 5: Indy Urban Acres Servings Grown and USDA Recommended Intake
### Table 6: Indy Urban Acres Yield, Total Pounds (vegetables)

<table>
<thead>
<tr>
<th>Category</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red and Orange</td>
<td>13,517</td>
</tr>
<tr>
<td>Dark Green</td>
<td>8,651</td>
</tr>
<tr>
<td>Starchy</td>
<td>2,659</td>
</tr>
<tr>
<td>Beans and Peas</td>
<td>415</td>
</tr>
</tbody>
</table>

### Table 7: Indy Urban Acres Yield, Servings Grown (vegetables)

<table>
<thead>
<tr>
<th>Category</th>
<th>Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red and Orange</td>
<td>39,053</td>
</tr>
<tr>
<td>Dark Green</td>
<td>33,029</td>
</tr>
<tr>
<td>Starchy</td>
<td>16,565</td>
</tr>
<tr>
<td>Beans and Peas</td>
<td>1,317</td>
</tr>
</tbody>
</table>

### Table 8: Indy Urban Acres Yield, Total Retail Value (vegetables)

<table>
<thead>
<tr>
<th>Category</th>
<th>Retail Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red and Orange</td>
<td>$34,414</td>
</tr>
<tr>
<td>Dark Green</td>
<td>$9,787</td>
</tr>
<tr>
<td>Starchy</td>
<td>$5,871</td>
</tr>
<tr>
<td>Beans and Peas</td>
<td>$200</td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
</tr>
</tbody>
</table>
Table 9: *Indy Urban Acres Yield, Retail Value per Serving (vegetables)*

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Yield per Serving (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red and Orange</td>
<td>$0.88</td>
</tr>
<tr>
<td>Other</td>
<td>$0.30</td>
</tr>
<tr>
<td>Dark Green</td>
<td>$0.35</td>
</tr>
<tr>
<td>Starchy</td>
<td>$0.15</td>
</tr>
<tr>
<td>Beans and Peas</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

*Food Distribution*

Within a block of the site is a local food pantry, run by Old Bethel United Methodist Church. This is the drop-off point from a majority of the produce grown at the farm. A small amount of produce is also given to Gleaners Food Bank for distribution at local elementary school-based pantry (IPS #14 Washington Irving). During the farm’s first year, data was collected to understand the amount of produce distributed to both entities. Data was not collected to understand how much of the produce was actually taken by pantry customers, if the produce taken was actually consumed, or how the produce was prepared before consumption. Anecdotal information from initiative participants suggests that some of the produce was not taken because it was unfamiliar to pantry customers.

Table 10: *Indy Urban Acres Produce Distribution, Pounds*

<table>
<thead>
<tr>
<th>Produce Distribution</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethel United Methodist Church Pantry</td>
<td>28,703</td>
</tr>
<tr>
<td>Gleaners (IPS #14 Washington Irving Elementary School)</td>
<td>6,099</td>
</tr>
</tbody>
</table>
Employment at the Farm

During its first year, the initiative employed two full-time employees at forty hours per week and three part-time employees at twenty hours per week.

Farm Participants

Though the primary focus during the first year at Indy Urban Acres was food production, the initiative itself garnered much local attention and interest. Groups from local institutions requested tours to learn about the initiative and urban farming. All seventeen of the individual community garden plots were claimed by neighborhood residents. Additionally, the Indianapolis Department of Parks and Recreation (IDPR) coordinated youth field-trips to the farm as part of their summer youth camp programming. While there, children had the opportunity to participate in three different kinds of workshops: Tool Use & Safety, Food Tasting, and How to Grow Your Own Food. Participating groups included:

- Boys and Girls Club: 150 participants
- IDPR Summer Youth Camps: 585 participants from 12 different camps
- La Plaza: 150 participants
- Rainbow House Academy: 75 participants
- IDPR Afterschool Groups: 100 participants

Hours Volunteered

Individuals volunteered labor to help with farm operations, mostly with weeding rows during the growing season. In all, a regular crew of about 27 neighbors contributed over 700 hours in volunteer labor. Large groups also pitched in almost 1,800 hours of volunteer labor. The large groups who contributed time were:
- IUPUI Cesar Chavez Day of Service: 85 individuals, 255 total hours of service
- IUPUI Bittersweet Day of Service: 45 individuals, 135 total hours of service
- World Refugee Day: 45 individuals, 180 total hours of service
- Butler University: 65 individuals, 195 total hours of service
- Marian University: 40 individuals, 80 total hours of service
- Lake City Bank/Fox 59 (television affiliate): 45 individuals, 180 total hours of service
- Seasons 52 (restaurant): 15 individuals, 30 total hours of service
- IUPUI: 40 individuals, 120 total hours of service
- Marion County Department of Health: 10 individuals, 30 total hours of service
- Marian University: 30 individuals, 60 total hours of service
- Eli Lilly Day of Service: 80 individuals, 320 total hours of service
- IUPUI Make a Difference Day: 60 individuals, 180 total hours of service

**Precedents: Urban Agricultural Organizations**

Within the City of Indianapolis, there are a multitude of urban agriculture initiatives. These are described in more detail under the section “The Case Study: Indianapolis”. Some of these initiatives are thriving and others are waning. However, within the existing group, just Indy Urban Acres, an urban farm run by the Indianapolis Parks Foundation on Indianapolis Parks and Recreation Department-owned land, can be characterized as a mission-based operation growing on a large scale in partnership with the city. It is a unique model that other cities have studied. The initiative’s commitment to donating the harvest to those is central to the goal of this study. The farm wishes to expand its mission to include more educational programming and internships. However, at the same time it is challenged with economic sustainability.
<table>
<thead>
<tr>
<th>Farm, Location, Overview</th>
<th>Farm Size</th>
<th>Distribution Methods</th>
<th>Job Training</th>
<th>Educational Programs</th>
<th>Growing Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Red Hook Community Farm (Brooklyn, NY)</strong></td>
<td>2.00 ac.</td>
<td>Donations, CSA (can be bought with sweat-equity), farmers mkt.</td>
<td>Youth employment (20/yr); full/part summer; monthly stipend</td>
<td>10 &amp; 26-week farm-class curriculum for first &amp; second graders</td>
<td>Seasonal extension through hoop houses</td>
</tr>
<tr>
<td><strong>Wood St. Farm (Chicago, IL)</strong></td>
<td>0.66 ac.</td>
<td>CSA (can be a reduced rate), farmers market and stand, restaurants</td>
<td>Agriculture and horticulture training, job readiness training</td>
<td>Gardening and cooking workshops</td>
<td>Greenhouses</td>
</tr>
<tr>
<td><strong>Growing Power (Milwaukee, WI)</strong></td>
<td>2.00 ac.</td>
<td>CSA, farmers markets/ co-ops, farm stands, and restaurants</td>
<td>Workshops, internships, apprentice-ships, and more</td>
<td>Farm-to-school, community outreach programs</td>
<td>Intensive, vertical farm greenhouses, aquaponics, vermin-compost</td>
</tr>
<tr>
<td><strong>Zenger Farm (Portland, OR)</strong></td>
<td>6.00 ac.</td>
<td>CSA (can use SNAP), farmers market and stand, restaurants</td>
<td>Interns: hands-on training and classroom instruction</td>
<td>Camps, apprentice-ships, workshops, field trips, nutrition education</td>
<td>Chemical free, hens rotated at farm to control weeds &amp; provide soil nutrients</td>
</tr>
<tr>
<td><strong>City Slicker Farm (W. Oakland, CA)</strong></td>
<td>7 farm sites, varying size</td>
<td>Donation-based farm stand; pay what you can</td>
<td>Summer youth employment and unpaid internships</td>
<td>Backyard Garden &amp; Youth Crews Programs, farming and nutrition workshops.</td>
<td>Varies at sites, includes; vermin-composting and biointensive</td>
</tr>
</tbody>
</table>
In order to propose a framework for the city, it is necessary to identify leading urban agricultural organizations that are both mission-based, partnering with cities, and focused on long-term sustainability. In this section, a number of such organizations are identified. It should be noted here that the urban farming “industry”, while somewhat nascent, is bursting with activity. Much of this is emerging, and much of it is documented on the internet. A detailed search for initiatives turns up thousands of results, and while judgment was used to determine the leading organizations herein, there may be others that are just as impressive.

The first group of initiatives and leading organizations are identified in Table 11: Leading Mission-Based Urban Agricultural Initiatives and Organizations. Furthering the focus, the initial list was narrowed to three organizations for further research. Those three, City Slicker Farms, Growing Home, Inc., and Zenger Farm all meet the prerequisites noted above, but also have a long-term (approximately ten years) track record with organizational success and economic viability. These three organizations are described in greater detail below and are used later in this study as precedents shaping the proposed organizational framework.

**Zenger Farm: Portland, Oregon**

The Friends of Zenger Farm was formed and incorporated in 1999 as a non-profit farm and wetland in dedicated to promoting sustainable food systems, environmental stewardship and local economic development through a working urban farm. At that time, the organization prepared a master plan for a sixteen-acre property, which was a former farm located in outer southeast Portland and bordered by three USDA-classified food deserts (Zenger Farm, 2012). At the time, the property was owned by the City of Portland’s Bureau of Environmental Services. Upon approval of the Conditional Use
Master Plan, the Friends of Zenger Farm partnered with the Bureau of Environmental Services to secure a 50-year lease of the property (Zenger Farm, 2012). In 2011, Zenger Farm added two acres the lease called the Furey property; a 30-plot community garden that is being run by Portland Park's Community Garden program. The organization is now a non-profit urban farm-mission (Zenger Farm, 2012).

The site is comprised of a 10-acre wetland and 6-acre organic farming operation. Fruits and vegetable crops are grown on four acres, without chemical fertilizers or pesticides. A flock of laying hens controls weeds in the garden and provides nutrients for soil; beneficial insects control pests. Laying hens and seasonal turkeys are raised on the farm. Honey bees are kept for honey production as well as pollination (Zenger Farm, 2012). In 2007, the on-property historic farmhouse was renovated as a center for
community involvement. Solar panels wrap around the front porch and are able to generate all the power used in the farmhouse. General Electric (GE) funded most of the project along with Energy Trust of Oregon. Rainwater is collected from the roof in two large cisterns, filtered, and re-used as potable water in the farmhouse. Reclaimed materials, energy efficient systems and locally made products were used throughout the renovation (Zenger Farm, 2013).

In addition to urban farming, experiential learning opportunities for youth and adults are a significant component to the organization’s mission. Education is promoted through sustainable agriculture, wetland ecology, food security, healthy eating and local economic development (Zenger Farm, 2012). In 2009, the Farmer in the Classroom program was created. The program includes three farm field trips during the school year...
and three classroom visits during the winter. In 2011, the program reached fourteen 5th grade classrooms and now the organization is now working with David Douglas School District to bring the program to every 5th grade class in the district (Zenger Farm, 2012). Hands-on, experiential field trips at the farm are offered for all age groups (Zenger Farm, 2012). In 2011, almost 6,000 individuals attended field trips. During the summer months, the farm offers eight different, weeklong summer camps for youth in first through ninth grades. Scholarships are available for those who cannot afford cost of camps (Zenger Farm, 2012). The organization’s Healthy Eating on a Budget program “strives to build community and empower participants to grow, shop for and prepare healthy, local and affordable foods by offering free workshops and demonstrations in our surrounding neighborhoods” (Zenger Farm, 2013). The interactive workshop focuses on local, seasonal, and affordable ingredients, though the content is tailored to the audience’s interests. Topics can include cooking skills, recipe sharing, budgeting, menu planning, shopping strategies, gardening, and neighborhood food resources (Zenger Farm, 2013). Over 600 youth and adults attended the workshop in 2011, and the organization is now seeking to expand the program (Zenger Farm, 2012).

Internships are a major programmatic component of the organization’s mission. Between fall 2012 and spring 2013, the organization had eleven interns, participating in a wide range of the organization’s programs. Intern positions included: Healthy Eating and Cooking Education Intern, Healthy Communities Intern, Farm Crew Intern, Field Trip Education Intern, Farm Education Intern, Healthy Food Intern, Community Livestock Intern, Community Involvement Intern (Zenger Farm, 2012). Internships are paid positions, but the farm also enjoys robust volunteer support. In 2011, 720 volunteers contributed over 6,000 hours in the fields and in the classroom (Zenger Farm, 2012).
Produce grown at the farm is sold at the Zenger Farm Farm Stand, through the farm community supported agriculture (CSA), and to local restaurants (Zenger Farm, 2012). The farm’s CSA program is one of the first CSAs in Oregon to accept SNAP (Zenger Farm, 2012). The organization also manages Lents International Farmer’s Market (Zenger Farm, 2012).

In 2011, the organization’s revenues were over $450,000; over 20% of this amount was generated from program fees and earned income. The organization enjoyed diverse sponsorship from individuals, businesses and corporations, government grantors, and foundational grantors. In the same year, expenditures were just under $400,000; 38% of this went towards education and training programs (Zenger Farm, 2012).
City Slicker Farm

City Slicker Farms is a twelve-year old mission-based organization in West Oakland, CA that, through urban agriculture, offers “tools for people to meet their basic need for fresh, healthy, affordable food for themselves and their families” (City Slicker Farms, 2013). The organization envisions a West Oakland “in which everyone has reliable access to fresh, healthy foods and to the knowledge and resources to grow it” (City Slicker Farms, 2013). The organization is focused on the neighborhood of West Oakland; a community of 23,000 residents, mostly African American, with just one food cooperative and one produce market (City Slicker Farms, 2013). To fulfill its mission,
City Slicker Farms offers three primary programs: a Community Market Farms Program, a Backyard Garden Program, and an Urban Farming Education Program.

The Community Market Farms Program transforms underutilized urban land into urban farms and open space. In 2011, the program grew over 34,000 pounds of...
produce. Produce is grown on five different urban farm sites, some of which are City parks. The produce is distributed to West Oakland residents at five different urban farm market stands, which are located at farm sites. Distribution is based upon a donation-only, sliding scale, so that nobody is turned away, even if they cannot afford to purchase the produce. In 2011, produce was distributed to 510 people through the market stands. This program is critical to many recipients; according to an organization-led survey, over half of customers rely on the produce weekly farms stand. More than one in four customers relies on free produce from the farms stand. Moreover, outcomes are being measured; vegetable consumption increased for customers who shopped the farm stand. Through this program, produce is also distributed to five local daycare centers to increase children’s nutrition (City Slicker Farms, 2013).

The Backyard Garden Program assists households and families in developing home gardens. In 2011, the Backyard Gardener Program supported almost 1,500 individuals in growing and estimated 23,000 pounds of their own produce. Through the program,
household gardeners and City Slicker Farms staff design gardens to suit a family’s needs and then build the garden in four hours. Households are responsible for maintaining backyard gardens, but the program provides two years of technical support as well as seeds, supplies, plants, and compost. If backyard gardeners stay with the program for one year, they are recruited to mentor beginning backyard gardeners. Mentoring can be either volunteered or paid. According to an organization-led survey, over sixty percent of the backyard gardeners reported that they receive over half of all their produce from their own garden (City Slicker Farms, 2013).

The organization’s Urban Farming Education Program provides opportunities for hands-on internships for youth and adults, tours for school and community groups, volunteerism, and apprenticeships. In 2011, the program trained 32 interns and 6 youth interns, who contributed over 3,000 hours of program assistance. In that same year, the program hosted over 50 community and school groups, or over 750 people, for field trips.
and welcomed almost 600 volunteers who contributed over 1,600 of service (City Slicker Farms, 2013).

In 2011, the organization had revenues of over $420,000; 12% of this revenue was earned-income through sales. The majority of income, 73%, came from foundations, government sources, and individual donations. During that same year, organization expenses were just over $410,000; almost three-fourths of this was dedicated to salaries, wages, and benefits (City Slicker Farms, 2013).

As a testament to the organization’s strength, success, and reach, in 2010 City Slicker Farms was awarded $4 million for the “West Oakland Park and Urban Farm Project”. This award was made through Proposition 84, $5.4 billion California bond initiative that invests in water quality and public open space projects. With this award the organization will purchase property and develop a park and urban farm. The four-acre site is a former brownfield, cleaned up under the supervision of the State of California. The community-driven design includes a 1.4-acre urban farm, a community
garden, a fruit orchard, a chicken coop, a beehive, open lawn for play, a tot lot, and a dog run. It will be the organization’s largest urban farm, and the only farm site that they actually own (City Slicker Farms, 2013).
Figure 6: Artist rendering of the new West Oakland Park and Urban Farm Project
Growing Home, Inc.

Growing Home, Inc. began in 1992 as a social enterprise seeking to provide hands-on job training for the homeless through urban farming (Growing Home, Inc., 2013). The organization seeks to “operate, promote, and demonstrate the use of organic agriculture as a vehicle for job training, employment, and community development” (Growing Home, Inc., 2012). The job-training program provides internships for adults looking to get their lives back on track after histories with homelessness, incarceration, and substance abuse (Growing Home, Inc., 2012). Interns are trained in agriculture, horticulture, food service, customer service, interpersonal and communication skills, and life skills (Growing Home, Inc., 2012).

The organization operates four farms. All farms are 100% USDA Certified Organic and produce grown at the farms is sold through a community supported agriculture.
program, at the Green City Market, and to Chicago restaurants (Growing Home, Inc., 2012). All proceeds from produce sales are used to maintain farm sites and improve the organization’s job training program (Growing Home, Inc., 2013).

The oldest farm is the 10-acre Les Brown Memorial Farm in Marseilles, IL. This farm is the home of the organization’s CSA program, a natural bee habitat, free range chickens, and two hoophouses (Growing Home, Inc., 2013). In 2003, the Su Casa Market Garden was established in the Chicago South Side neighborhood of Back of the Yards. This is a small garden on the property of Su Casa Catholic Worker, a “soup kitchen, food pantry, safe space for displaced Latino families” (Growing Home, Inc., 2013). Through the Englewood neighborhood’s Quality of Life Plan, Growing Home, Inc. was invited into the community to establish the Wood Street Urban Farm in 2006. The
Wood Street Urban Farm originally started on city-owned land, which was officially transferred to Growing Home in 2007. Today the 0.66-acre site includes a building used as for classroom space, office space, and vegetable processing. Produce grown at this farm is distributed at the on-site farm stand and at the Green City Market in Lincoln Park. The Honore Street Farm, also in Englewood, was developed with assistance from the City of Chicago and NeighborSpace (Growing Home, Inc., 2013).

In 2011, the organization’s revenues totaled over $1.1 million. Approximately 12% of this revenue was generated through earned income. Government grants, private and corporate grants, and individual contributions accounted for over 83% of the total revenues (Growing Home, Inc., 2013). The organization’s 2011 expenses were just over
$1 million; just over 80% of these expenses were for program expenses (Growing Home, Inc., 2013).

Photograph 28: Farm activity in the heart of the city

Photograph 29: Work inside the Wood Street Farm greenhouse
A Comparison: Leading Urban Farms and Indy Urban Acres

To better understand the performance of Indy Urban Acres against the following leading urban farming organizations, a detailed comparison was conducted. In that comparison, data was used from annual reports and websites. In addition, correspondence with the organizations yielded information that was not otherwise available. From this analysis, recommendations are made under “A Framework and Strategy”.

- City Slicker Farms (City Slicker Farms, 2013), (City Slicker Farms, 2013), (City Slicker Farms, 2013).
- Zenger Farm (Zenger Farm, 2012), (Zenger Farm, 2013), (Zenger Farm, 2012), (Zenger Farm, 2013), (Zenger Farm, 2012), (Zenger Farm, 2012), (Zenger Farm, 2012), (Zenger Farm, 2012).
Land and Cultivation

Leading farms/organizations tend to have multiple farm sites; less emphasis is placed on amount of produce grown than on programmatic elements.

Table 12: Number of Farms

<table>
<thead>
<tr>
<th></th>
<th>Indy Urban Acres</th>
<th>Best Practices Average</th>
<th>City Slicker Farms</th>
<th>Growing Home</th>
<th>Zenger Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Farms</td>
<td>1</td>
<td>3.33</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 13: Land under Cultivation, acres

<table>
<thead>
<tr>
<th></th>
<th>Indy Urban Acres</th>
<th>Best Practices Average</th>
<th>City Slicker Farms</th>
<th>Growing Home</th>
<th>Zenger Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres</td>
<td>1.56</td>
<td>2.25</td>
<td>1.58</td>
<td>1.15</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 14: Produce Grown, pounds

<table>
<thead>
<tr>
<th></th>
<th>Indy Urban Acres</th>
<th>Best Practices Average</th>
<th>City Slicker Farms</th>
<th>Growing Home</th>
<th>Zenger Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds</td>
<td>35,577</td>
<td>13,433</td>
<td>8,800</td>
<td>13,500</td>
<td>18,000</td>
</tr>
</tbody>
</table>

Table 15: Pounds Grown, per acre

<table>
<thead>
<tr>
<th></th>
<th>Indy Urban Acres</th>
<th>Best Practices Average</th>
<th>City Slicker Farms</th>
<th>Growing Home</th>
<th>Zenger Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds/acre</td>
<td>22,806</td>
<td>7,259</td>
<td>5,555</td>
<td>11,721</td>
<td>4,500</td>
</tr>
</tbody>
</table>
**Income**

Leading farms/organizations have a broad base of financial support through a diversity of contributors, including grantors, foundations, small businesses, corporations, individuals. Leading farms also generate approximately 15% of all income through earned income. Earned income sources include produce sales, and fees for tours, classes, and workshops.

**Table 16: 2011 Income**

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Indy Urban Acres</th>
<th>Best Practices Average</th>
<th>City Slicker Farms</th>
<th>Growing Home</th>
<th>Zenger Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>100%</td>
<td>71%</td>
<td>63%</td>
<td>79%</td>
<td>59%</td>
</tr>
<tr>
<td>$200,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$400,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$600,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$800,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Grants**: 71% in Indy Urban Acres, 12% in Best Practices Average, 27% in City Slicker Farms, 12% in Growing Home, 100% in Zenger Farms.
- **Contributions**: 14% in Indy Urban Acres, 14% in Best Practices Average, 63% in City Slicker Farms, 21% in Growing Home, 59% in Zenger Farms.
- **Earned**: 14% in Indy Urban Acres, 21% in Best Practices Average, 26% in City Slicker Farms, 20% in Growing Home, 20% in Zenger Farms.
- **Interest**: 1% in Indy Urban Acres, 1% in Best Practices Average, 1% in City Slicker Farms, 1% in Growing Home, 1% in Zenger Farms.

**Table 17: 2011 Income – Leading Farms Average (left), Indy Urban Acres (right)**

- **Grants**: 71% for Leading Farms Average, 100% for Zenger Farms.
- **Contributions**: 14% for Leading Farms Average, 14% for City Slicker Farms, 14% for Zenger Farms.
- **Earned**: 14% for Leading Farms Average, 14% for City Slicker Farms, 21% for Zenger Farms.
- **Interest**: 1% for Leading Farms Average, 1% for City Slicker Farms, 1% for Zenger Farms.
Support

Support is indicated in the number of supporters per organization. Leading farms average many numbers and a broad diversity of supporters.

Table 18: 2011 Supporters

Table 19: 2011 Supporters - Leading Farms Average (left), Indy Urban Acres (right)
Expenses

Over 75% of leading farm/organization expenses are attributable to supporting programming services. This includes staffing and other programmatic resources.

Clearly, this is a major emphasis of these mission-based organizations.

Table 20: 2011 Expenses

Table 21: 2011 Expenses - Leading Farms Average (left), Indy Urban Acres (right)
Staffing

Leading farms/organizations employ a significant number of internships, both youth and adult, as an educational component of their work. Interns also contribute a significant time to farm labor. Interns are generally retained for a season and are paid a stipend.

Table 22: 2011 Staffing

Table 23: 2011 Staffing - Leading Farms Average (left), Indy Urban Acres (right)
Participants

Volunteerism and farm tours/field trips are the primary source of participation.

Volunteers include individuals from the neighborhoods, as well as organizations and their employees contributing time for community service-oriented outreach.

Table 24: 2011 Participants

<table>
<thead>
<tr>
<th>Farm</th>
<th>Volunteers</th>
<th>Tour Attendees and/or Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indy Urban Acres</td>
<td>587</td>
<td>460</td>
</tr>
<tr>
<td>Average</td>
<td>1,060</td>
<td>2,543</td>
</tr>
<tr>
<td>Best Practices</td>
<td>765</td>
<td>1,060</td>
</tr>
<tr>
<td>City Slicker Farms</td>
<td>1,000</td>
<td>720</td>
</tr>
<tr>
<td>Growing Home</td>
<td>5,863</td>
<td></td>
</tr>
<tr>
<td>Zenger Farms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 25: 2011 Participants - Leading Farms Average (left), Indy Urban Acres (right)

<table>
<thead>
<tr>
<th>Farm</th>
<th>Volunteers</th>
<th>Tour Attendees and/or Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourers</td>
<td>85%</td>
<td>64%</td>
</tr>
<tr>
<td>Visitors</td>
<td>2,543</td>
<td>1,060</td>
</tr>
<tr>
<td>City Slicker Farms</td>
<td>85%</td>
<td>64%</td>
</tr>
<tr>
<td>Visitors</td>
<td>2,543</td>
<td>1,060</td>
</tr>
<tr>
<td>Volunteers</td>
<td>460</td>
<td>587</td>
</tr>
<tr>
<td>Tourers</td>
<td>1,060</td>
<td>587</td>
</tr>
<tr>
<td>Visitors</td>
<td>1,060</td>
<td>587</td>
</tr>
<tr>
<td>Volunteers</td>
<td>460</td>
<td>587</td>
</tr>
<tr>
<td>Tourers</td>
<td>1,060</td>
<td>587</td>
</tr>
<tr>
<td>Volunteers</td>
<td>460</td>
<td>587</td>
</tr>
</tbody>
</table>
**Service Hours**

Service hours are defined by the amount of time volunteers and interns spend working at the farm. It should be noted that Zenger Farms does not tally the number of intern hours; if tracked, this would represent a significant amount of time because the Farm routinely employees over ten interns per season.

*Table 26: 2011 Service Hours*

*Table 27: 2011 Service Hours - Leading Farms Average (left), Indy Urban Acres (right)*
Precedents: City and District Initiatives

Often when looking to establish a framework, one looks to principled and proven practices that have been long-established. These precedents are typically “tried and true” and are well understood. Most types of built environment solutions can fit within this category, but those that are emerging tend to have fewer precedents and lack established “best practices”. Such is the case when trying to identify cities which have developed a comprehensive strategy for urban agriculture with city involvement.

Rather than populate this document with numerous examples of how various cities are attempting numerous and varied strategies, a focus is made to illustrate two innovative approaches at two different scales. The Philadelphia example is one at a city scale. The approach to addressing “food deserts” is highly applicable to this work. Additionally, the rigor introduced with establishing targets and follow-up provides a means for understanding success, or lack of success. By contrast, the Chicago example is one of neighborhood/district scale and grassroots relationships that form the backbone of the initiative. It also has applicability in this work because locally-formed relationships are a critical ingredient to the success of the leading urban farms noted earlier.

Philadelphia, PA

Under Mayor Michael Nutter, Philadelphia has established a number of effective and productive City-wide initiatives aimed at increasing locally-grown fresh produce throughout the city. The City is aggressively combatting issues of food insecurity and food access not just through planning, but through active implementation. With this comprehensive approach, the City has garnered much national attention and has been awarded a number of significant grants to implement a number of programs.
In 2008, the Philadelphia Food Charter was created to “facilitate the development of a sustainable city food and urban agriculture system – one that contributes to community, economic, health and environmental goals; encourages local production, protecting our natural and human resources; recognizes access to safe, sufficient, culturally appropriate and nutritious food as a basic right for all Philadelphians; fosters community gardens and farming; creates economic opportunities for neighborhood residents; encourages collaboration and builds upon the efforts of existing stakeholders throughout the city and region; and celebrates Philadelphia’s multicultural food traditions” (City of Philadelphia, 2009).

After adoption of the Charter, a number of City initiatives were developed to foster urban farming in Philadelphia. Of these, the City is promoting the conversion of City-owned landed into food production spaces. Various city departments are working collaboratively to make these lands accessible to residents and organizations interested in establishing gardens or urban farms on the city-owned land. The City supports this interest through addressing barriers such as permitting, irrigation, and liability insurance. In an effort to reduce risk to organizations seeking to establish urban farms, the Mayor’s Office of Sustainability promotes the use of community supported agriculture (CSA) buying clubs so organizations and farmers can pool resources and receive upfront payments for investments made in crops. Lastly, to assist in locally-grown produce distribution, the city has invested in a large-scale pilot project to increase such food in neighborhood corner stores. The City also supports neighborhood food co-ops through special financing and development incentives (City of Philadelphia, 2009).

In 2009 the Greenworks Philadelphia plan was completed. This ambitious plan was tagged as a blueprint for making Philadelphia the greenest city in America. The report includes fourteen broad targets across five different categories: Energy, Environment,
Equity, Economy, and Engagement. Target #10 is to bring local food within ten minutes of 75% of residents. As a consistent theme within this target, the City seeks to forge partnerships with non-profit and for-profit organizations to address pressing needs in communities with little or no access to fresh, healthy food (City of Philadelphia, 2009).

Figure 7: GreenWorks Philadelphia Fresh Food Access Map (2009)
Greenworks Philadelphia identified vast areas of the city lacking access to fresh, locally-grown food. To address these disparities, the plan provided three specific recommendations. The first of these recommendations was the establishment of twelve new commercial agriculture projects in the city over eight years. This initiative would be supported by the City through investments in distribution facilities, agricultural supply centers, water sources, and processing facilities. The second recommendation was to create 59 food-producing gardens throughout the City. The Mayor’s Office of Sustainability supports this recommendation by working with academic, business, and non-profit partners to provide technical assistance to residents and communities interested in gardening and urban farming. This support includes providing seeds, tools, pots, organic fertilizers, books, and classes. The Horticultural Center in Fairmount Park has been identified as the institutional hub for providing this support. The plan’s third recommendation sought to establish fifteen new farmers’ markets across Philadelphia. In support of these markets, the City, through the Mayor’s Office of Sustainability, works with non-profit and for-profit groups that would work with local community development corporations to promote neighborhood interest in the market. Additionally, the city assists in on-site infrastructure needs such as parking and access to water (City of Philadelphia, 2009).

The City has tracks progress towards goals on an annual basis. Since 2009, 24 new farmers’ markets and 29 new farms or garden have been established throughout the city. Ten of the new farmer’s markets were established in low-income communities through a partnership between the Philadelphia Department of Public Health and The Food Trust. This investment was made possible through the Get Healthy Philly initiative, which was established through a $15 million grant from the U.S. Department of Health and Human Services (City of Philadelphia, 2012).
In 2011, the Philadelphia Food Policy Advisory Council was created. This council has emphasized affordability as a key element to sustainable, locally-grown produce. They have put forth a number of recommendations to improve upon existing City programs. Among the recommendations, the council seeks to raise awareness about
SNAP enrollment and using benefits at farmers’ markets and food cupboards; to align access to food sources with public transportation systems; and address questions of land tenure and risk through a pilot project which establishes mid- and long-term leases on public, vacant land to urban farming organizations, entrepreneurs, and individuals (City of Philadelphia, 2012).

To document and improve the start-up processes for food entrepreneurs, various City agencies are working to create a “Guide for Food Businesses”. Additionally, landholding agencies have drafted uniform guidelines for use of City-owned vacant land for urban farming. In 2011, a new zoning code revision not only allowed urban agriculture business to be located in a number of different zones, but also provided incentives for their establishment. Lastly, urban farming technical assistance was provided to 300 individuals between 2010 and 2011 through the Pennsylvania Horticultural Society. Funding was provided through the USDA (City of Philadelphia, 2012).

Chicago, IL

Like Philadelphia, the City of Chicago can also claim a number of effective and productive initiatives aimed at improving access and availability to locally-grown produce. The City is taking a long view at sustainability through their GO TO 2040 plan, and local food systems, including urban agriculture, play a central role. However, a smaller study, currently underway, highlights a district-level approach to these issues. That study, called the Green Healthy Neighborhoods initiative encompasses thirteen square miles on the city’s South Side, and is home to over 11,000 vacant lots (Rotenberk, 2012). In contrast to the Philadelphia example, it offers a district-level focus on urban farming and engages specific organizations to bring that about.
The Green Healthy Neighborhoods project, started in 2011 and set to wrap-up in April 2013, is a partnership between the City of Chicago Department of Housing and Economic Development, Local Initiatives Support Corporation/Chicago New Communities Program, and the Chicago Metropolitan Agency for Planning (providing technical support through a Sustainable Communities Initiative grant from the U.S. Department of Housing and Urban Development). The planning initiative seeks to address common urban ills – lack of employment opportunities, depressed housing markets, and declining populations – through recommendations for neighborhood housing, commercial uses, transportation, urban agriculture, green infrastructure, and cultural and historic community resources. A central objective is to identify opportunities for neighborhood reinvestment, building upon existing assets as catalysts (Chicago Metropolitan Agency for Planning, 2013).

A number of neighborhoods – Greater Englewood, portions of New City, Woodlawn, Washington Park, and portions of Fuller Park, Grand Boulevard, and Greater Grand Crossing – are included in this study. Some neighborhoods have previously completed Quality of Life Plans with LISC and are already making strides toward neighborhood reinvestment (Chicago Metropolitan Agency for Planning, 2013).

Related to urban agriculture, the plan establishes a handful of goals: increase food security; encourage community gardening; increase the availability of and access to fresh and healthy food options; improve the local food economy; establish urban agriculture districts; modify zoning and ordinances to support food related enterprises; encourage the establishment and connection of food production, processing, distribution, preparation, workforce training, and consumption / outlets (Chicago Metropolitan Agency for Planning, 2013). More specifically, the plan hopes to develop a unified network of farmers distributing products along the corridor; a new food distribution center and fresh
produce processing plant; and source of produce for customers such as local residents, restaurants, universities, and hospitals (Rotenberk, 2012).

Figure 9: Artist rendering of Raber Park open space

As of March 2013, the report now includes issued draft "Building Productive Landscapes" strategies. Included are three urban farming zones, which are seen as catalysts to neighborhood reinvestment that would grow food and horticultural products, and provide job training and educational opportunities.
The Englewood Line Zone is planned around two existing, highly successful urban farms already in place – the Wood Street Farm and the Honore Street Farm, both of which are run by Growing Home, Inc. The plan has identified 28-acres of potential urban agriculture land within this district, though just 1.3-acres of urban farming exists in the neighborhood today. The majority of the land recommended for future urban farming is located between 58th and 59th Streets, and straddles an abandoned rail line (Chicago Metropolitan Agency for Planning, 2013). That rail line is part of the three-mile long New ERA (Englewood Re-making America) Trail, which is envisioned to be the central spine of the farming districts. This former rail line will be converted into a line park and trail with farm stands (Rotenberk, 2012). The Raber Park Zone straddles the same abandoned rail line that runs through Englewood. Here, the plan recommends to build upon the new Perry Street Farm and the historic, but shuttered Raber House as existing assets line. Lastly, the Rock Island Zone centers around a second abandoned rail line, also to be converted to a trail, and a planned urban farm project called Eat to Live (Chicago Metropolitan Agency for Planning, 2013).
The strategy recommends a site preparation program that would include environmental testing and cleanup/treatment; site design and permitting; capping, fencing, parking, stormwater management, and water installation. It is estimated that these improvements would cost $250,000 per half-acre, but result in a turnkey site for prospective growers. To implement the plan, it is recommended that the city partner with nonprofits, community based organizations, and social enterprises to design and manage new urban agricultural initiatives within these neighborhoods (Chicago Metropolitan Agency for Planning, 2013).
Mapping High-Risk Areas
Mapping Methodology

Like any major city, Indianapolis is home to many urban neighborhoods with differing socioeconomic status. Some neighborhoods, such as Broad Ripple and Meridian-Kessler, are more affluent. Others, such as Holy Cross and the Haughville are less affluent. Most people in the city can likely generally characterize various neighborhoods according to familiarity and reputation. However, when determining priority areas within the city, a more rigorous method of identification is necessary.

First, we return to the primary problems: food insecurity, fresh produce access, and chronic illness. It is here that we define risk for each problem through social, economic, and demographic indicators. The indicators are established through research-based associations or links to the primary problems. As an example, the literature indicates that a households headed by a single mother with own children under the age of eighteen is strongly associated with food insecurity. It is through a series of indicators like this example that a composite map can be generated for each primary problem.

A composite map is prepared for each of the three primary problems: food insecurity, fresh produce access, and chronic illness. Each map is prepared for each primary problem by quantifying a series of indicators for each census tract within the county. Returning to the food insecurity example, three indicators have been identified to be strongly associated with food insecurity. For the sake of this example, we choose one of the indicators: the percent of households headed by a single mother with own children under the age of eighteen. Using U.S. Census data within ArcMap GIS, we are
able to determine the percentage of households matching indicator criteria within each census tract. For each primary problem, each percentage for each indicator within each census tract is added to one another to yield a **factor**: an aggregate numerical figure representing the relative value of risk from one census tract to another. Because factors are calculated in the same manner for each census tract, the values can be compared across all census tracts. The census tracts with the highest factors are defined as most at-risk. Returning to our example, three indicators are strongly associated with the primary problem of food insecurity. Each indicator is quantified as a percent within each census tract. Within each census tract, all three percentages are added up to yield a food insecurity factor. For each primary problem, the highest factors within the county are determined to be high-risk areas.

After determining at-risk census tracts for each primary problem, the three problem area maps are overlaid with one another to create a composite map. Numerical information/factors are no longer used. This overlay technique indicates where the high-risk census tracts for each primary problem overlap with one another. Census tracts with a high degree of overlap and general areas having a high concentration of high-risk census tracts are identified as priority areas. Priority areas are places where interventions are recommended.

Following is specific description of indicators and mathematical calculations used for each primary problem to determine high risk-areas. At the end of this section is the composite map of all three primary problems, indicating priority areas throughout the city. As an appendix to this report, all indicator maps are included.
Primary Problem: Food Insecurity

Indicators for food security

- Household Income: at or below poverty line
- Unemployment: higher than Marion County average
- Household Type: female householders with own children < 18 years old

Formula used to determine high-risk areas for food insecurity

\[(F_i) = [H_f + H_i + U]\]

\((F_i)\) represents: Factor for all indicators within census tract
\((H_f)\) represents: Households headed by single female with own children < 18, expressed as percent
\((H_i)\) represents: Household income at or below poverty line, expressed as percent
\((U)\) represents: Unemployment, expressed as percent
Primary Problem: Fresh Produce Availability and the Food Environment

Indicators for fresh produce availability

- Fresh Produce Availability: full service retail groceries and supermarkets
- Fresh Produce Availability: food pantries
- The Food Environment: presence of convenience stores

Formula used to determine high-risk areas for fresh produce availability

\[(Fpa) = [S+Fp-Fe]\]

\(Fpa\) represents: Factor for all indicators within census tract
\(S\) represents: Supermarkets within census tract, expressed as a number
\(Fp\) represents: Food pantries within census tract, expressed as a number
\(Fe\) represents: Convenience stores within census tract, expressed as a number
Figure 13: Food Availability and Food Environment Indicators Map
Primary Problem: Chronic Illness

Indicators for chronic illness

- Race: Black and Latino, higher than Marion County average
- Age: over 55 years old
- Household Income: less than $15,000
- Education Attainment: less than high school diploma

Formula used to determine high-risk areas for chronic illness

\[(Ci) = [Ra+Rl+A+Hi+Ea]\]

(Ci) represents: Factor for all indicators within census tract
(Ra) represents: Race African American, expressed as percent
(Rl) represents: Race Latino, expressed as percent
(A) represents: Age over 55, expressed as percent
(Hi) represents: Household income under $15,000, expressed as percent
(Ea) represents: Education attainment less than high school, expressed as percent
Figure 14: Chronic Illness Indicator Map
Composite Map

The Composite Map is an overlay of all three primary problem maps. The highest risk areas for each primary problem are illustrated in a unique color.

*Figure 15: Composite Indicators Map*
Target Areas

Where high-risk areas overlap, and where there are significant concentrations of high-risk areas, target areas are defined. Areas indicated by the dashed outline are target areas.

Figure 16: Target Areas
The proposed framework represents the synthesis of all preceding study: An Unhealthy System, Health & Urban Built Environment, Addressing the Problem, and Mapping High-Risk Areas. Outlined below is an approach that the City of Indianapolis can pursue, with partners, to improve access and availability of locally-grown produce. All recommendations center on two core tenets:

1. This initiative is mission-based and is focused on high-risk areas;
2. This initiative requires program longevity through economic sustainability.

The framework includes three components: City Participation, Garden and Farm Typologies, and Green Locations. Together, they describe the who, what, where, and how of this framework. City Participation informs the degree to which the City can promote a local food system and targeted interventions within neighborhoods. Garden and Farm Typologies describes the types of interventions that can be considered to be aligned with the overall mission and the role that they might play within differing contexts. In this section, local partnership types that are believed to be necessary in broadening and sustaining interventions are also outlined. Lastly, Green Locations are specific places where interventions can occur within targeted neighborhoods.

**City Participation**

There are many initiatives currently underway in the City, as documented under The Case Study: Indianapolis. This study recognizes and supports those efforts, including the community gardening program, led by the Mayor’s Office of Sustainability, the work
happening at Butler University, and all of the non-profit and community-based organizations working on important initiatives: the Capital City Garden Project, the Filege Hiywot Center, the Global Peace Initiatives, Growing Places Indy, Going Local, Indy Tilth, Indy (Grows) Gardens, Keep Indianapolis Beautiful, and the KI EcoCenter. Those efforts and initiatives have laid the groundwork for Indy Urban Acres and all that is to follow. This framework seeks to build from those existing resources and assets, and possibly engage them as partners.

Guidance and Oversight

As seen in the Philadelphia and Chicago, City participation can occur on multiple levels. To begin, this framework recommends that the City consider adopting an overarching policy and statement about food – an Indianapolis Food Charter. The Charter would outline the City’s vision for locally-grown food and its importance to health, economy, equity, community, and environment. It would lay the foundation for all the work that the City could then support and promote. Developing this Charter could be accomplished through existing City resources, existing community resources, or a newly-created Food Policy Council (at present Bloomington is thought to be the only city in the state with a Food Policy Council). An existing community resource, the Food Coalition of Central Indiana has already drafted an Indianapolis Food Charter (included as Appendix 3: Indianapolis Food Charter. That draft could serve as a strong starting point for the City.

With a Food Charter in place, the City could consider appointing and funding a specific entity, such as the Mayor’s Office of Sustainability, the Parks Department, or a newly-created Food Policy Council, to establish, link, and coordinate existing and new programs that may span City departments and/or may be associated with outside
organizations. This entity could also identify and apply for local, state, and federal grants and identify philanthropic donors and private-sector donors.

**Supported Initiatives**

The primary objective identified in this study is to provide, through the City, increased availability and access to fresh produce. A number of initiatives could contribute to achieving that objective, including small backyard gardens, modestly-sized, neighborhood-based community gardens, and large, community-serving urban farms. The various options are further detailed under Garden and Farm Typologies. Supported initiatives could include those that exist, as well as those that are to come in the future.

**Land Policy**

Often urban agriculture initiatives are hampered by uncertainty over land tenure and zoning restrictions. The City should consider removing zoning barriers, ideally with the ongoing Rezone Indy project, as well as promote use of public land for urban farming and gardening. Public land used for urban farming could include city-owned vacant property, schoolyards, City parks, and trails and greenways. Sites could be prioritized as recommended under Green Locations.

In accordance with the adopted Food Charter, the land would be offered as a tool for addressing produce access and availability, as well as neighborhood stabilization, reinvestment, and beautification. Organizations interested in mid- (5-10 years) and long-term (beyond 10 years) use of public land should be asked to enter leases with the City. Terms of the lease may be adapted to the different groups wishing to lease the land. For example the City may consider leasing the land to well-organized neighborhood associations and non-profit organizations at no-cost, while charging a percentage of
gross earned-income revenues for-profit organizations. While this leasing structure may not provide a significant and direct revenue stream to the City, it supports efforts that have the potential of increasing neighborhood property tax revenues, improving resident health and thus decreasing public share of healthcare costs, lessening crime and costs of public safety measures, and decreasing pervious surface and management of wet weather overflows.

**Incentives and Support**

Similar to other cities, Indianapolis could consider supporting new urban agricultural projects on a number of levels, including planning, implementation, and start-up. Depending on the type and scale of initiative, the City’s level of support may vary. This study proposes that the City focus their work with organizations and neighborhood associations to achieve objectives. Among other tasks, those groups would, in turn, work with individuals on small initiatives. The proposed role of organizations and associations is further detailed under Garden and Farm Typologies.

During the planning phase, the City could consider assisting with permit applications, waiving permitting fees, and expediting review. Other planning assistance could include sharing with prospective individuals and organizations past projects that have been implemented in the City and are of similar size and scope. During the implementation phase, the city could consider connecting electric and water service. Larger community garden and urban farm projects should be encouraged, if not required, to store and re-use stormwater on site. The City may consider supplying rainwater collection and storage devices for this purpose. During startup, the City may consider offering farmer training classes, tools, seeds, non-chemical fertilizers, and compost. Many of these items might be offered in partnership with local institutions or
businesses. For instance training might be offered in conjunction with Butler University, IUPUI, Ivy Tech, or any number of local higher education institutions.

**Garden and Farm Typologies**

Urban agriculture of all types and sizes helps to achieve goals of increased availability and access to fresh produce. Typologies could include backyard gardens, community gardens, and urban farms. Scale could range from individuals and families to neighborhoods and communities. The end result is a connected and coordinated system with certain shared resources. The vision is for an “above all” approach that promotes use of under-utilized land, self-empowerment, and self-sufficiency.

The concepts detailed below (under Farms at Community Scale and Gardens at Neighborhood Scale) fall within the overall framework represented in the following table.

*Table 28: Farm and Garden Typologies at a Glance*

<table>
<thead>
<tr>
<th>Feature</th>
<th>Urban Farm (not-for profit)</th>
<th>Urban Farm (for profit)</th>
<th>Community Garden</th>
</tr>
</thead>
<tbody>
<tr>
<td>On City Park Land</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Urban Vacant Lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Residential District</td>
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<td></td>
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</tr>
<tr>
<td>Along Bus Line</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Along Well-Connected Streets</td>
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<tr>
<td>Near Arterials and Trails</td>
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<tr>
<td>High Visibility</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Proximity to Community Resources</td>
<td></td>
<td></td>
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<tr>
<td>On-site Building</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>On-site Shed</td>
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<td></td>
<td></td>
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<tr>
<td>On-site Parking</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gathering Spaces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Garden Plots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming Activities</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Organized Food Distribution</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
A Framework for a Civic-Urban Farm Model in Indianapolis

A Framework and Strategy

City Implementation Assist

City Infrastructure Assist

City Assistance with Training

Long-term Land Lease

In this framework, the term “farm” or “urban farm” connotes an agricultural endeavor that is combined with educational programming and community outreach. It is similar to the sixteen-acre Zenger Farm: a mission-based initiative serving numerous people because of its breadth of programs, yet still community-based. Wood Street Farm, just 0.66 acres, also fits these criteria. Because the farm size cannot vary quite dramatically, this plan does not dictate how big or small an operation, rather it recommends well-suited lands, a blend of programming activities, farm elements, and potential organizational oversight.

Farms at Community Scale

In this framework, the term “farm” or “urban farm” connotes an agricultural endeavor that is combined with educational programming and community outreach. It is similar to the sixteen-acre Zenger Farm: a mission-based initiative serving numerous people because of its breadth of programs, yet still community-based. Wood Street Farm, just 0.66 acres, also fits these criteria. Because the farm size cannot vary quite dramatically, this plan does not dictate how big or small an operation, rather it recommends well-suited lands, a blend of programming activities, farm elements, and potential organizational oversight.

Land Characteristics

Certain public lands are well-suited to these types of urban farms. Lands may be larger public parks, such as either community- or regional-scale parks. According to the 2009-2014 Indianapolis-Marion County Park, Recreation & Open Space Plan, regional parks are at least 50 acres, while community parks are 25-100 acres in size. At present, the Indianapolis Department of Parks and Recreation has seven regional parks and twenty community parks (Indy Parks & Recreation, 2009). Lands may also be smaller neighborhood-scale parks, school sites, or tracts of non-contaminated city-owned vacant property.

Within these areas, the farm program would include: land for growing fruits and vegetables; a building or structure for storage and programming functions; a small
parking area; well-designed site elements, including pathways, gathering spaces for community and neighborhood events, open spaces, passive educational features, and farm identifiers such as signs or landmarks. This is further described below under “Farm Elements”.

**Proximities**

As the literature shows, urban farms with a community focus are most successful when location and proximities are carefully considered. These proximities can include urban infrastructure such as roads and walks, but also community-based resources such as schools and community centers. The critical element here is to understand the people-based nature of the farm. These operations tend to thrive in densely settled residential neighborhoods, where many can easily gain access to the farm. As noted earlier, this proximity encourages participation, increases visibility, improves perceptions of neighborhood aesthetics and safety, and has been shown to positively affect residential property values.

Proximity to, or within densely-populated residential districts demands a well-connected street and sidewalk network. In addition street and sidewalk presence, access to farms can be gained through presence of public transit, and nearby trails and greenways. These modes and devices of connectivity are critical to create and activate farms as destinations. Just as those devices can connect a farm to people, other devices can act as barriers to connectivity. High-speed and excessively wide roadways, rail lines, and at times, waterways can act as deterrents to access, particularly for children or for those with mobility difficulties. Ideally, farms are located within high-density residential districts along moderately busy streets that are well-connected to other sidewalks and other modes of transportation.
Beyond physical attributes and proximities, location should be considered alongside existing community-based resources. These resources, such as community centers, food pantries, day care centers, schools, community and neighborhood organizations, and faith-based organizations may not be publicly-run, but are centers of community activity and outreach. These resources, like the urban farm, seek to be people-based. Understanding the location of these established resources is the first step in building community and synergy with urban farms.

**Programming Activities**

Programming is a critical element to farms at this scale. Programming represents the extension of mission, beyond just growing produce, to include educational, outreach, and training opportunities. As seen in the leading urban farm examples, this extension is a way to further integrate a farm into the surrounding neighborhood, address the daily issues that exist in these high-risk areas, and encourage resident participation. This last
element is critically important because as the literature indicates, increased participation can lead to positive lifestyle and health outcomes.

*Figure 17: Positive relationship between programming and participation*

Possibilities for programming include: classes (cooking, gardening, fitness, healthy eating, budgeting, and shopping), workshops, events, produce stands, farm field trips, farm tours, youth and adult internships, and community garden plots. Though programming is primarily developed for the surrounding neighborhood, oftentimes (as seen in the leading urban farm examples) the greater community becomes interested in participating as well. This can become a welcomed and important source of visibility and awareness. Additionally, some leading organizations leverage this increased interest by charging a modest fee for farm tours and farm field trips, and thus generating earned income. These fees are waived for low-income groups.

Though the benefits are tremendous, programming requires resources: human, physical, and capital. As seen in the leading examples, most annual expenditures are spent on programming, in the form of staff that is assembled to support various education, outreach, and training offerings. Though these human resources are a significant expense, the programming that they deliver represents an important opportunity for the organization to reach a broader base of donors and grantors. This broader base may be interested in initiatives that go beyond food production and who
seek to support neighborhood-based education, outreach, and training. Leading organizations are successfully employing this win (community) – win (organization) – win (donor) strategy with surprising numbers of contributors.

Figure 18: Programming activities and degree of resources necessary

The physical requirements of programming come in the form of a building or structure that houses functions. Leading farms have on-site structures available for classes, cooking demonstrations, light food processing, small community gatherings, and staff offices. These structures can be relatively basic, without a high degree of interior finish. They can also be creative, adaptive re-use of existing structures, as is the case with Zenger Farm’s sustainable renovation of an old barn. In this example, many of the sustainable elements were creatively financed or provided through donation or grants.

Farm Elements

As noted above, basic farm elements are necessary for functionality. These elements must be thoughtfully designed and organized to relate internally to the farm, but also to farm edges and the broader community. Care should be taken to emphasize a neighborhood’s sense of place and cultural heritage. As the literature indicates, preservation and celebration of ethnic culture promotes use of and participation in these types of spaces. Capital expenditures for implementation are an important

<table>
<thead>
<tr>
<th>low amount of resources</th>
<th>community garden plots</th>
<th>events</th>
<th>internships</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>farm field trips</td>
<td>classes</td>
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<td></td>
<td></td>
<td>farm field tours</td>
<td>workshops</td>
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<td></td>
<td></td>
<td></td>
<td>produce stands</td>
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<tr>
<td>high amount of resources</td>
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</tbody>
</table>
consideration, as is the overall level and quality of construction and finish. Studies noted earlier have shown that the aesthetic quality of these types of spaces impact perception, participation, and surrounding property values. A careful balance between capital improvement costs and quality of space must be achieved.

The basic farm elements that should be a part of this type and scale of farm include: land for growing fruits and vegetables; a building or structure for storage and programming functions; a small parking area; pathways; gathering spaces for community and neighborhood events’ open spaces; passive educational features; and farm identifiers such as signs or landmarks. The organizational layout of these elements will vary by site, but several key principles should be applied consistently:

Photograph 31: Flexible gathering space at Red Hook Community Farm
Achieve a high degree of **visibility** into the activity areas – buildings, garden areas, and larger gathering spaces – to convey a sense of safety as well as active participation.

Design gathering spaces with **flexibility** so they can comfortably accommodate different group sizes.

Develop a **diversity** of open spaces for events, recreation, and small groups.

Foster a sense of community through **porous edges**; invite the neighborhood into the site to explore and participate.

Populate the site with opportunities for **passive learning**, such as bulletin boards, interpretive signage, and demonstration elements.

Celebrate the area’s **heritage** through thoughtful integration of design elements and styles that are culturally important.

Thoughtfully **integrate** parking for access and convenience, but somewhat concealed from the street edge, or perhaps provided through on-street spaces.

Figure 19: **Diagrammatic layout of programmatic and farm elements**

A. Crops, highly visible from streets
B. Building, highly visible from street
C. Gathering spaces, highly visible from street
D. Community garden plots
E. Small Parking area
Organizational Oversight

Leading urban farms which operate as “Farms at Community Scale” are typically run by mission-based organizations, not city or governmental agencies. In that regard, Indy Urban Acres is somewhat a unique example. Organizations can be private for-profit or not-for profit. Usually, but not always, organizations are not-for-profit groups that can leverage their corporate status for certain grant and funding opportunities. As seen in the leading farm examples, these organizations tend to work with cities to implement initiatives.

This framework recommends that the City consider partnering with organizations that are mission-based and focused on food production as well as education, outreach, and training. The organization would be responsible for operating the farm, all farm activities, and educational programming. The city would supply land on which urban
farms could be operated, as well as supporting infrastructure. Though City assistance may be necessary to fund portions of the farm construction, organizations should seek to identify funding sources as well.

Interested organizations that fit this description may or may not exist. In order to better gauge the interest of possible organizations, the City could release a Request for Information or a Request for Proposal. Results of this solicitation could identify whether other steps are necessary. The City could also reach out to certain community-based organizations that have a deep interest in the programming aspects of these initiatives. Though those organizations may not necessarily be connected to urban agriculture at present, they may choose to work with farmers to satisfy food production as well as education, outreach, and training objectives. These existing groups could be approached on a one-on-one basis to determine their level of interest.

The selected organization should have an aggressive approach to marketing, fundraising, and economic sustainability. As seen in the leading examples, the ability to attract donors and grantors is a requirement for operating urban agriculture organizations that are mission-based. Expansion of the mission beyond food and into programming will likely produce additional funding opportunities with a diverse group of donors. Donors and grantors should be pursued at all levels, including individuals, small businesses, foundations, corporations, public agencies, and quasi-public agencies. Marketing and fundraising activities should include events and partnerships that fuel interest in the initiative as well as build and expand upon the base of contributors.

Food Distribution

The mission-based focus of this study emphasizes food distribution to those in high-risk areas. Most residents face financial hardship, making healthier eating options more difficult. As has been noted earlier, cheaper, less nutritious food is often a necessary
source of nourishment for families, including those with young children. Over time, unhealthy eating habits are developed and risk of chronic illness grows. Those caught in this battle, particularly children, have little opportunity to change their situation.

Through growing fresh produce in areas of most need, a new opportunity is presented. Food grown on urban farms can be made available to local residents, as is the case with City Slicker Farms. It is recommended that, as is the case there, food be made available to residents and that no resident be turned away. In acknowledging the need to foster economic sustainability, it is also recommended that fresh produce be sold to residents who can afford to pay. A number of mission-based urban farms attempt this; City Slicker Farms does so with a three-tiered sliding price scale (free, market rate, and discount). An attempt at this model is recommended. Additionally, as noted earlier with many farms, it is recommended that the organization establish the ability to accept Supplemental Nutrition Assistance Program (SNAP) benefits through Electronic Benefits Transfer technology. This would allow qualifying individuals and families to use SNAP benefits to purchase lower-cost fresh produce.

Gardens at Neighborhood Scale

A number of characteristics described under “Farms at Community Scale” can also apply to a second typology: Gardens at Neighborhood Scale. The primary distinctions between the two are that gardens will tend to be community-driven will likely not include a programming component.

Land Characteristics

Gardens at neighborhood scale can be tucked into smaller areas, such as neighborhood-scale parks, school sites, tracts of non-contaminated city-owned vacant property, or along waterways and greenways. This typology could be considered
“gardens of opportunity” because they might be found where land for growing is available more so than larger operations requiring more proximities.

Components of gardens at neighborhood-scale might include: land for growing fruits and vegetables; a small shed for storage; necessary elements for moving about, such as sidewalks; gathering spaces for small events, passive educational features, and farm identifiers such as signs or landmarks. This is further described below under “Garden Elements”

Proximities

Since these garden spaces are a product of opportunity, proximity becomes somewhat secondary to simply establishing a garden space where there is community desire. However, because these garden spaces will tend to be community-driven, it is important to consider proximities to the degree possible. Therefore, proximities important to farms at community-scale are also important to gardens at neighborhood-scale. These proximities are: densely settled residential neighborhoods, roads and walks, community-based resources such as schools and community centers, public transit, nearby trails and greenways, and waterways.

Programming Activities

Gardens at neighborhood scale are likely to have minimal programming associated with the initiative. As community-driven endeavors, the main focus is food production. Opportunities for programming could emerge through garden-based events, seasonal outreach events, and participation with local schools.

Garden Elements

There is likely to be little financial support for gardens at neighborhood scale. Understanding this challenge, these spaces are likely to be minimally improved.
Materials may be sought through donation and installation may be assisted by volunteer efforts. The basic garden elements are likely to include: land for growing fruits and vegetables; a small shed for storage; pathways (likely mulch or crushed stone); small gathering spaces that could be constructed from reclaimed materials; and garden identifiers such as signs or landmarks. Though simple in nature, site organization principles should be considered:

- Achieve a high degree of visibility into the activity areas – garden areas and gathering spaces – to convey a sense of safety as well as active participation.
- When possible, structure spaces with flexibility so they can comfortably accommodate different group sizes.
- Foster a sense of community through porous edges; invite the neighborhood into the site to explore and participate.
- Celebrate the area’s heritage through thoughtful integration of design elements and styles that are culturally important.

Photograph 33: Donated materials at the Highland Youth Garden in Columbus, OH

Photograph by Camille Applewhite
Organizational Oversight

The gardens in these small spaces will likely be started and maintained by residents and neighborhood associations. The City can assist these groups by providing basic infrastructure to the site, such as water and electricity. The City can also assist by providing tools, seed, and basic gardening education.

Food Distribution

The produce grown in these gardens is a gift to the neighborhood. As such, these spaces are open to families who wish to supplement their diets through harvesting fruits and vegetables. In cases where the bounty may exceed local demand, organizers of the garden may wish to collect the excess and distribute it to a local food pantry.

Green Locations

The term “Green Locations” is used to describe the physical location of either Farms at Community Scale or Gardens at Neighborhood Scale. Green Locations must take into account the basic functions of the initiative: Programming Activities, Farm Elements, Organizational Oversight, and Food Distribution. But most important to identifying specific location are criteria of Land Characteristics and Proximities. Collectively, these criteria can be studied geographically and recommended sites can emerge.

The process for arriving at recommended sites starts with focusing on the Target Areas, as defined earlier. From there, a geospatial analysis of Physical Infrastructure and Community Resources is conducted. Woven into this process are discussions with the Indianapolis Department of Parks and Recreation, who helped identify good candidates for Green Locations. For the purposes of this study, a particular focus was
made to study potential Green Locations for Farms at Community Scale. It is assumed that potential Green Locations for Gardens at Neighborhood Scale will emerge through community-driven response and desire. The criteria laid out elsewhere in this study could serve as a guide for the City in determining those suitable Green Locations. The proposed Green Locations for Farms at Community Scale should be considered a starting point for further discussion. Additional locations may be identified; alternate locations may emerge as more suitable. The key is to understand the methods for analysis to further contemplate locations beyond the limits of this study.

To identify potential Green Locations for Farms at Community Scale, a mapping database was compiled for the Target Areas. This GIS-based inventory included the identified Physical Infrastructure and Community Resources layers. Those layers were overlaid with one another to identify Green Locations opportunities. The process for analyzing the overlay was through a logical study of the factors; a numerical scoring system was not used.

Physical Infrastructure

Elements of physical infrastructure exist in a city’s urban fabric. Primarily, these are elements of density, land use, and connectivity. Each element listed below has been taken into account in this analysis. The basis of spatial mapping data is Marion County GIS, as provided by IMAGIS.

Positive Elements

- Well-connected roads: a grid of streets facilitating greater neighborhood access
- Presence of sidewalks: safe travel ways for all ages and degrees of mobility
- Densely-settled residential neighborhoods: more families who can participate
- Good visibility: from streets where activity can be seen
Public transit: to transport those without vehicles, those coming from greater distances, those seeking shelter from inclement weather, or those bringing home a heavy bag of produce

Nearby trails and greenways: to provide safe access for multiple travel modes

**Negative Elements**

- High-speed and excessively wide roadways: these can be barriers of mobility and present a safety problem; particularly for youth
- Rail lines: often difficult to cross and often a neighborhood divide
- Waterways that bisect areas: waterways that rest well below street level create a neighborhood divide

**Community Resources**

Beyond a city’s infrastructure, community resources represent the social structure of a neighborhood. Presence or absence of these resources can impact a community’s or neighborhood’s strength and sense of place. Elements of physical infrastructure exist in a city’s urban fabric. Community resources can be public, private, or quasi-public. Given mapping limitations, not each item listed below has been taken into account in this analysis. Those items marked with an asterisk (*), have not been mapped. It is proposed that as a next step to this study, additional mapping occur to account for these community resources.

- *Community centers: run by the Parks Department, the YMCA, Boys & Girls Club, and many other organizations
- *Food pantries: a demonstration of commitment to helping neighborhood families
- *Day care centers: where children gather on a daily basis to learn and explore
- *Schools: where all community youth of all ages gather on a daily basis to learn and explore
- *Community and neighborhood organizations: groups committed to improving the neighborhood and strengthening the ties that bind it together
• Faith-based organizations: weekly social gathering places and community pillars
• Neighborhood organization: participation with Local Initiatives Support Corporation (LISC) on Quality of Life Planning and other community improvement initiatives
Figure 20: Citywide Green Locations
Figure 21: Anna Brochhausen School 88
Figure 22: Beckwith Park
Figure 23: Doris Cowherd Park
Figure 24: Gardner Park
Figure 25: Haughville Park
Figure 26: John Ed Park
Figure 27: Orange Park
Figure 28: Reverend Mozel Sanders Park
Figure 29: Virginia Lee O'Brien Park
Figure 30: Watkins Park
Figure 31: Willard Park
Figure 32: Woodruff Place Esplanades


http://www.cmap.illinois.gov/documents/20583/1286271/ProductiveLandscapes_9-29-12-1small.pdf/998069bd-ba81-410c-81bb-eac2e0f37cc7


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Appendix 1: Indy Urban Acres Post Occupancy Evaluation Questionnaire

The Indy Urban Acres Post Occupancy Evaluation questionnaire, by Eric Lucas.

<table>
<thead>
<tr>
<th>Indy Urban Acres Farm</th>
<th>Post Occupancy Evaluation</th>
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<tbody>
<tr>
<td><strong>1.00 Baseline Information</strong></td>
<td></td>
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<tr>
<td>1.01 Location, neighborhood demographics</td>
<td></td>
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<tr>
<td>1.02 Overall site size, area farmed</td>
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<tr>
<td>1.03 Owner</td>
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<tr>
<td><strong>2.00 Roles of Key Participants</strong></td>
<td></td>
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<tr>
<td>2.01 Indy Parks &amp; Recreation</td>
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<td>2.02 Indianapolis Parks Foundation</td>
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<td>2.03 IU Health</td>
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<td>2.04 Gleaner’s Food Bank</td>
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<td>2.05 Farmer</td>
<td></td>
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<tr>
<td>2.06 Ball State University</td>
<td></td>
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<tr>
<td>2.07 Community Advocates</td>
<td></td>
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<tr>
<td><strong>3.00 Project Goals</strong></td>
<td></td>
</tr>
<tr>
<td>3.01 Key social (crime deterrent, outreach, etc.) goals</td>
<td></td>
</tr>
<tr>
<td>3.02 Key ecological (site reclamation, reduced impervious surface, etc.) goals</td>
<td></td>
</tr>
<tr>
<td>3.03 Key economic (job creation, job-training, etc.) goals</td>
<td></td>
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<tr>
<td>3.04 Key health (increased fresh produce access, improved health, etc.) goals</td>
<td></td>
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<tr>
<td>3.05 Key aesthetic (addressing blight, adding community amenity, etc.) goals</td>
<td></td>
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<tr>
<td>3.06 Did the goals change during course of project?</td>
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<tr>
<td>3.07 Other</td>
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<tr>
<td>3.08 Other</td>
<td></td>
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<tr>
<td>3.09 Other</td>
<td></td>
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<tr>
<td>3.10 Other</td>
<td></td>
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<tr>
<td><strong>4.00 Problems that the Project Attempted to Address</strong></td>
<td></td>
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<tr>
<td>4.01 Fresh produce access</td>
<td></td>
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<tr>
<td>4.02 Other</td>
<td></td>
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<tr>
<td>4.03 Other</td>
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<tr>
<td><strong>5.00 Tactics Used to Address Problems</strong></td>
<td></td>
</tr>
<tr>
<td>5.01 Organicity grown fresh produce</td>
<td></td>
</tr>
<tr>
<td>5.02 Fresh produce distributed at local pantry and school</td>
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<tr>
<td>5.03 Other</td>
<td></td>
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</table>
## Indy Urban Acres Farm

### 6.00 Post-implementation Problems

<table>
<thead>
<tr>
<th>6.01</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.02</td>
<td>Other</td>
</tr>
<tr>
<td>6.03</td>
<td>Other</td>
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### 7.00 Design

<table>
<thead>
<tr>
<th>7.01</th>
<th>Key design elements</th>
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<tbody>
<tr>
<td>7.02</td>
<td>Did the design change during implementation?</td>
</tr>
<tr>
<td>7.03</td>
<td>How has the design/overall site organization functioned?</td>
</tr>
<tr>
<td>7.04</td>
<td>Would end users recommend alterations in hindsight?</td>
</tr>
</tbody>
</table>

### 8.00 Farm Practices

<table>
<thead>
<tr>
<th>8.01</th>
<th>Acres under production</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.02</td>
<td>Soil preparation (testing, remediation, and amendment requirements)</td>
</tr>
<tr>
<td>8.03</td>
<td>Crops planted (types and amounts)</td>
</tr>
<tr>
<td>8.04</td>
<td>Crop yields (by crop, in pounds)</td>
</tr>
<tr>
<td>8.05</td>
<td>Number of people employed at the farm (full-time, part-time, or seasonal status)</td>
</tr>
<tr>
<td>8.06</td>
<td>Hours of volunteer time contributed to farm</td>
</tr>
<tr>
<td>8.07</td>
<td>Estimation of on-farm employee or volunteer time allocation to management, planting, weeding, cultivation, distribution, outreach, etc.</td>
</tr>
<tr>
<td>8.08</td>
<td>Good agricultural practices (GAP) certification</td>
</tr>
<tr>
<td>8.09</td>
<td>GAP methods utilized</td>
</tr>
<tr>
<td>8.10</td>
<td>Soil-building practices</td>
</tr>
<tr>
<td>8.11</td>
<td>Compost practices (amount, source)</td>
</tr>
<tr>
<td>8.12</td>
<td>Weed suppression or eradication practices</td>
</tr>
<tr>
<td>8.13</td>
<td>Planting practices (methods, time of year, machinery requirements)</td>
</tr>
<tr>
<td>8.14</td>
<td>Cultivation practices (methods, time of year, machinery requirements)</td>
</tr>
<tr>
<td>8.15</td>
<td>Watering methods and drought-response measures</td>
</tr>
<tr>
<td>8.16</td>
<td>Pest and disease control methods and frequency</td>
</tr>
<tr>
<td>8.17</td>
<td>Grading, washing, packing practices</td>
</tr>
</tbody>
</table>

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**Legend:**
- Black = All suggested to address item
- Blue = PR suggested as lead in addressing item
- Red = Farm Manager suggested as lead in addressing item
- Green = BU suggested as lead in addressing item

10/23/2012
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<tr>
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</thead>
<tbody>
<tr>
<td>8.18</td>
<td>Farm inputs supply-chain (local, regional, national suppliers and vendors)</td>
</tr>
<tr>
<td>8.19</td>
<td>Annual water consumption</td>
</tr>
<tr>
<td>8.20</td>
<td>Annual energy consumption</td>
</tr>
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</table>

**Post Occupancy Evaluation**

**Indy Urban Acres Farm**

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<thead>
<tr>
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<tbody>
<tr>
<td>9.00</td>
<td>Food Distribution</td>
</tr>
<tr>
<td>9.01</td>
<td>Method of distribution (pick-up or drop-off, trucking type)</td>
</tr>
<tr>
<td>9.02</td>
<td>Frequency of distribution</td>
</tr>
<tr>
<td>9.03</td>
<td>Amount distributed (total pounds)</td>
</tr>
<tr>
<td>9.04</td>
<td>Amount distributed to Bethel Pantry</td>
</tr>
<tr>
<td>9.05</td>
<td>Any amount not taken by customers at Bethel Pantry?</td>
</tr>
<tr>
<td>9.06</td>
<td>Amount distributed to IPS 14</td>
</tr>
<tr>
<td>9.07</td>
<td>Food pantry details (number/type of families taking food, amount taken, actual produce consumption vs. amount taken)</td>
</tr>
<tr>
<td>9.08</td>
<td>Estimated amount of consumable food not distributed (due to naturally occurring imperfections, bruises, blemishes, etc.) that is composted</td>
</tr>
<tr>
<td>9.09</td>
<td>Estimated amount of consumable food not distributed (due to naturally occurring imperfections, bruises, blemishes, etc.) and that goes to waste</td>
</tr>
<tr>
<td>9.10</td>
<td>Produce preferences (are certain types more popular at pantry?)</td>
</tr>
</tbody>
</table>

**10.00 Perception and Participation**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>10.01</td>
<td>Has this project been well-received by City administration? How does this project relate to the City's ongoing community garden initiatives?</td>
</tr>
<tr>
<td>10.02</td>
<td>What type of recognition of interest in this project has been shown by Indianapolis-based groups, companies, or organizations?</td>
</tr>
<tr>
<td>10.03</td>
<td>What type of recognition of interest in this project has been shown by regional or national groups, companies, or organizations?</td>
</tr>
<tr>
<td>10.04</td>
<td>How has this project been received by the local neighborhood? Has vandalism, theft, or other crime occurred at the farm?</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10.05</td>
<td>What organized participation programs occur at the farm (types and size of groups, ages of visitors, types of activities, frequency of visits, time of visits, length of visits, method of arrival)?</td>
</tr>
<tr>
<td>10.06</td>
<td>Use of community garden plots (how many being used, how participatory are neighbors, do neighbors also help in the main garden)?</td>
</tr>
<tr>
<td>10.07</td>
<td>Is garden used for neighborhood socializing?</td>
</tr>
<tr>
<td>10.08</td>
<td>What non-organized participation occurs at the farm (types and size of groups, types of activities, frequency of visits, time of visits, length of visits, method of arrival)?</td>
</tr>
</tbody>
</table>

### 11.00 Infrastructure

- **11.01** Water presence and adequacy
- **11.02** Irrigation system presence and adequacy
- **11.03** Electrical service presence and adequacy
- **11.04** Gas service presence and adequacy
- **11.05** Stormwater management and/or collection presence and adequacy
- **11.06** Site lighting presence and adequacy
- **11.07** Internal roadways presence and adequacy

### 12.00 Lessons Learned and Future Opportunities

- **12.01** Opportunities for an improved process
- **12.02** Opportunities for improved facility design
- **12.03** Opportunities for improved implementation
- **12.04** Opportunities for improved on-farm resources (equipment, staffing, etc.)
- **12.05** Opportunities for increased yields

*Black = All suggested to address item
Blue = IPH suggested as lead in addressing item
Red = Farm Manager suggested as lead in addressing item
Green = BSU suggested as lead in addressing item*
<table>
<thead>
<tr>
<th></th>
<th>Indy Urban Acres Farm</th>
<th>Post Occupancy Evaluation</th>
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<tbody>
<tr>
<td>12.06</td>
<td>Opportunities for an improved farm supply-chain</td>
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<tr>
<td>12.07</td>
<td>Opportunities for improved farm water/soil resources management</td>
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<tr>
<td>12.08</td>
<td>Opportunities for improved/increased school/youth/community outreach and education (ecological, health, physical activity, nutrition)</td>
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<td>12.09</td>
<td>Opportunities for improved/increased advocacy and/or partnerships</td>
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<td>12.10</td>
<td>Opportunities for improved distribution models</td>
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<tr>
<td>12.11</td>
<td>Opportunities for improved outcome measurement (i.e. food production, food access, health, community participation, job creation)</td>
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<tr>
<td>12.12</td>
<td>Interest in expanding farming operations (food processing and livestock)</td>
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<tr>
<td>12.13</td>
<td>Outcomes critical to sustaining the effort</td>
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<tr>
<td>12.14</td>
<td>Opportunities for improved site selection</td>
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</tbody>
</table>
Appendix 2: Leading Urban Farm Questionnaire

The Leading Urban Farm questionnaire, by Eric Lucas.

Interviewee:
Interview Date:

Farm Location
Is the farm on public land?
If so, who is the landowner and describe the land arrangement with the public entity?
How close is the farm to public schools, recreation centers?
Is the farm located in a residential area, commercial, industrial, or mixed-use area?
Is the neighborhood home to the farm densely populated?

Produce Distribution
Does the farm donate produce? If so, to what organizations/causes?
Does the farm sell produce? If so, to what types of customers?
If the farm sells to residents, describe how pricing is structured and the types of payments accepted. Where is the produce sold? Describe how residents arrive at sales locations (i.e. walk, public transit, car, bike, etc.).

Growing Practices
Is the produce organically grown? Is the farm a USDA certified organic operation?
How many pounds are grown per acre? Is crops grown intensively? If so, describe practices that increase yields, extend seasons, or increase harvests.
Are crop-type decisions made specific to the neighborhood’s cultural identity?

Education and Outreach
Does the farm offer youth educational programs? If so, what are the programs, what are the age groups participating, and how many participants were there in the last year?
Does the farm offer adult and/or youth cooking and gardening classes? If so, are there statistics on participants (number, ages)?
Does the farm distribute recipes to produce customers?
How many volunteer hours occurred at the farm last year? List the volunteer groups participated.
Does the farm include community gardens?
Establishment

Did local government assist in establishing the farm (i.e. utilities, permitting, land, etc.)? If so, how?
Describe any community participation in designing or establishing the garden.

Facilities

Describe any buildings/structures on the farm and used by the farm.
Did these buildings/structures exist or were they built for farm purposes?
Is rainwater collected and re-used for irrigation? If so, describe in what manner this is accomplished.

Employment

How many full-time employees does the farm employ? List the titles of those employees. How many are year-round employees?
How many part-time employees does the farm employ? How many hours per week? How many months per year?
Does the farm provide internships? If so, how many per year, for how many months during the year, and for how many hours per week? What age groups are eligible for internships?

Tracking Progress

Does the farm track outcomes (i.e. consumption, preparation, health benefits) of the produce sold and/or given away to residents?
Has the farm tracked outcomes of the youth and/or adult educational programs against produce intake?
Does the farm track individual customers’ purchase method?

Economic Sustainability/Viability

What are the farm’s revenues and expenditures? What are the specific revenues and expenditures (i.e. grants, produce sales, donations, etc. for revenues; salaries, electricity, insurance, marketing, etc. for expenditures)?
How many donors and supporters?
Describe the approach to attracting donors and supporters?
Appendix 3: Indianapolis Food Charter

(Food Coalition of Central Indiana, 2013)
Now, therefore, be it resolved by the community of the city of Indianapolis, that to promote food security, we will encourage and facilitate:

<table>
<thead>
<tr>
<th>Community-based Responses</th>
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<tbody>
<tr>
<td>1. practical nutrition education programs that promote healthy eating, food shopping, budgeting, gardening and cooking skills, thus enhancing our community's knowledge of purchasing, handling, preparing, consuming and storing of nutritious, affordable and safe local food;</td>
</tr>
<tr>
<td>Real food security for all citizens requires good information and practical skills. Food is more than a commodity. It is a basic right. Many of the skills required for good food and nutrition practices in our urban settings have not been passed down from previous generations, thus leaving our citizens vulnerable to food shortages in these inflationary times.</td>
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<tr>
<td>2. the healthy practice of breastfeeding;</td>
</tr>
<tr>
<td>Breastfeeding provides reduced instance of disease and the best possible nutrition for infants at almost no cost. Breastfeeding benefits women's health by lowering the risk of many diseases, such as breast and cervical cancer.</td>
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<tr>
<td>3. conditions that ensure that each child of our community has access to nutritious food that enables effective learning and lifelong health;</td>
</tr>
<tr>
<td>Realizing this goal will require: appropriate nutrition for expectant mothers that support unborn children; community and inter-generational cooking programs that create awareness of the need for balanced eating, and the skills needed to implement such knowledge; partnering with public schools to improve food quality, promote school gardens and local purchasing; and creating an awareness of the need for consuming enough water.</td>
</tr>
<tr>
<td>4. access to programs by seniors that support health and independence;</td>
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<tr>
<td>Seniors health and independence in the community depends on their access to sufficient and nutritious food. Programs focused on senior needs will improve quality of life for seniors and so reduce community costs.</td>
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<td>5. the preservation of our local agricultural resources and a reliable, economical, clean water source;</td>
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<tr>
<td>As a community we must place value on the components of food security which include (but aren’t limited to) arable land, pollinators, bio-waste, farmers, clean water, and biodiversity.</td>
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<tr>
<td>6. the creation of infrastructure to support income generating ventures in urban gardening and farming and large-scale local food sourcing, including distribution facilities, agricultural supply centers, and preparation and storage facilities;</td>
</tr>
<tr>
<td>Both the urban and rural economy can be supported by cooperative ventures between food distribution or food retail operations and food producers. Frequently the capacity to grow, process and store food until needed is greater in an area already equipped for agriculture. However, in Indianapolis this is not yet the case, thus food related economic opportunities abound.</td>
</tr>
<tr>
<td>7. municipal policies that promote responsible re-use of the city's waste and water as well as a sustainable local economy, generating adequate incomes for all;</td>
</tr>
<tr>
<td>Potential programs could encompass the redirecting of bio-waste to local composting facilities, used cooking oil to local bio-diesel plants, and implementing the use of rain barrels, rain gardens, composting toilets and grey water re-use systems.</td>
</tr>
<tr>
<td>8. the role of community farmers markets and urban gardens in increasing access to local, fresh fruits and vegetables in neighborhoods, thus increasing food security citywide;</td>
</tr>
<tr>
<td>In a convenience driven society, easy access to local food producers through multiple retail outlets such as farmer's markets, Indy Food Cooperative, Basic Roots Community Foods, CSA's (Community Supported Agriculture) and other local food distribution operations creates a connection to our food which fosters healthy eating habits. Knowing your farmer is the ultimate food security.</td>
</tr>
<tr>
<td>9. local purchasing among major employers, our city institutions and community organizations in order to provide an affordable range of healthy local food choices within their facilities;</td>
</tr>
<tr>
<td>As the largest and most visible consumers these organizations should set an example of economic responsibility to local businesses and the health of the citizenry of Indianapolis.</td>
</tr>
<tr>
<td>10. events which emphasize the city's distinctive multi-cultural food customs and bring together rural and urban people.</td>
</tr>
<tr>
<td>Unfamiliar cultures are easily accessed and appreciated through their food customs, while local food sourcing emphasizes the many close ties between the urban and surrounding rural cultures. Connections made are a source of great benefit to all, and cause for community celebration.</td>
</tr>
</tbody>
</table>
Appendix 4: Primary Problem Individual Indicator Maps