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Reaching Austin's Maximum Agricultural Production

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Reaching Austin's Maximum Agricultural Production

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Abstract

Reaching Austin's Maximum Agricultural Production

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The University of Texas at Austin, 2013

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Austin has residents that have health and nutrition issues that are linked to a lack of access to healthy foods. Some urban agriculture experts believe that one way to help mitigate the issue of access is to increase the amount of food that is produced locally. This report will look at planning issues involving food production, examine the amount of food that is being produce at farms located in Austin, make an inventory of available agricultural lands that have the potential for food growth, and make a basic calculation of how many people food from those lands could feed.

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Introduction

This report is about the current amount of food produced on Austin's farms, the lands available for further agricultural growth, the potential food production on those lands, and how these elements could impact some of the planning issues associated with local food production. It provides size, production data, and maps of Austin's farms, the location of current agricultural land uses within Austin's jurisdictional boundaries, basic calculations on how much food could be produced on suitable agricultural lands and how many people could have their vegetables provided by Austin only, and a discussion of some the relevant topics most commonly associated with urban agriculture and local food movements. It also discusses some topical issues that have arisen with the recent rewriting of the City of Austin's Urban Farm Code.

The American Planning Association (APA) has recognized that food is an issue that has been ignored in planning. In the introduction to its 2007 Policy Guide of Community and Regional Food Planning it states:

Food is a sustaining and enduring necessity. Yet among the basic essentials for life – air, water, shelter, and food – only food has been absent over the years as a focus of serious professional planning interest.

Austin shares some of the food related concerns that are seen in the United States. The first issue relates to nutrition and public health. In 2010, more than one third of children and adolescents in the United States were either overweight or obese (Center for Disease Control and Prevention 2013). In Austin, a 2008 study showed that 35% of Austin Independent School District students in grades 3 to 12 were overweight or obese (Dell Children's Medical Center of Central Texas 2013). There are a number of contributing factors that lead to this type of health problem but a few key components are the lack of access to healthy foods, the often restrictive price of healthy foods for low-

income residents, the need to educate parents on where to get and how to prepare healthy foods, the amount of time it takes for working parents to prepare raw foods, and not having a culture of eating healthy, local foods (Banks 2011, 5, 33). Furthermore, 63% of students in the Austin Independent School District come from families that are of a low socio-economic status and qualify for a free or reduced price breakfast and lunch at the school cafeteria (Austin Independent School District 2011). This means they have two meals each school day that are not prepared at home that do not reinforce making healthy food choices.

An increase in local foods does not equate to increased access to healthy foods for those in the highest need. Organic foods tend to cost more than industrially grown foods and because of subsidies and low transportation costs, foods that come from out of region are often less expensive than local foods (Banks 2011, 33). Shelter is often the priority with regards to money spending for low-income residents. When it comes time to decide on what foods to get, the cheap easy option is often what seems best. The frequent consumption of high-fat, high-sodium, high-sugar processed foods leads to long term health problems like obesity, heart disease, and diabetes (Ladner 2011, 200).

What local foods can provide in terms of health is a higher nutrient level than the same foods that are grown in the current industrial agricultural system (Pollan 2008, 115). The oversimplification of the soils for the “modern” system strips vegetables of micronutrients that play an important role in a person’s health. When discussing local foods, there is an assumption that the same methods used in the global system would not be employed, that they would grow in more complex soil system, have longer growth periods, establishing a deeper root structure, thereby becoming more nutrient rich than their industrial counterparts (Pollan 2008, 120).

Even if local food production were to dramatically increase, access to these foods would still be an issue as many low-income residents live in food deserts, lacking easy access to grocery stores or farmers markets that provide the healthy food options that could help mitigate the previously mentioned health problems (Banks 2011, 25). Coordination among many disciplines of planning, governmental agencies, and citizen groups would be necessary to address this ongoing issue. The high number of corner stores and fast food chains in low income neighborhoods, where the unhealthy foods are purchased, could be addressed by zoning changes. Establishing non-chain groceries in the food deserts would require help from financial institutions or incentives from the local government (American Planning Association 2007, 11).

Another planning related food concern is community health and security. Many urban communities are dependent on a centralized food system in which local residents have little investment and participation, other than the purchases made at grocery stores (American Planning Association 2007, 4). Food prices are low because the price of fossil fuels is low, making the production and transportation of these goods inexpensive. Any spike in the cost of oil is going to increase the price of food, which will have the greatest impact on citizens that already struggle to find money for a healthy diet (Delaware Valley Regional Planning Commission 2010, 1). The ability to increase food production at the local level should also be evaluated as some theories predict traditional agricultural exporters will export less in the future as their urban populations increase and their rural populations decrease. It might become necessary for those agricultural producers to hold on to more of their food for their growing populations (Delaware Valley Regional Planning Commission 2010, 1). These countries might also need to hold onto their food if yields continue to fluctuate due to unpredictable weather extremes. Just five years ago

grain prices doubled, causing some countries to make panic food purchases and rioting ensued in thirty countries due to food shortages (Gillis 2013).

Events in the United States have led to questions about the safety and security of communities that rely on global food trade. After the attacks of 9/11 and Hurricane Katrina, New York City and New Orleans found that they had only three days worth of food in the city (Cockrall-King 2012, 31). If access into Austin, or any metropolitan area, were cut off, how long would the city have the means to sustain itself? This leads to one of the essential questions addressed in this report: What is the capacity of Austin's current food sources?

To help alleviate some of the access, health, nutrition, and safety concerns Austin could seek to utilize more of its own land for food production. Local food production is never going to make the global system irrelevant but it can help reduce the dependency upon that system (American Planning Association 2007, 3). Austin has been a part of the recent national trend to have an increased interest in "local" food production. The growth of farmers markets in Austin over the past ten years, from three in 2003 to eleven in 2013 suggests that there is an increased demand for foods that are grown closer to home (Sustainable Food Center 2013). This growth mirrors nationwide trends in farmers market growth, from 2,863 in 2000 to 8,144 in 2013 (United States Department of Agriculture 2013).

Much of the food at the farmers markets comes from the Austin region, not the city of Austin itself (Sustainable Food Center 2013). To begin addressing the issue of Austin's food capacity an inventory of current food production within Austin's jurisdictional control is necessary. There are five farms in Austin's full purpose jurisdiction that are actively being used for food production. How much land do these farms use for food growth and much food are they producing?

If more local food could play even a small part in addressing community health issues, the next step would be to identify the lands on which the food could be grown. The lack of fresh local foods is not for a lack of growing space. In Austin's city limits alone there are 82,400 acres of agricultural land use (City of Austin GIS 2013). The majority of that agricultural land is located in East Austin on soils are suitable for growing crops that fare well in the Central Texas climate (City of Austin 2013, 5). This leads to another question that will be addressed by this report. Given current zoning and land use categories how much agricultural or other land could be devoted to agricultural production and what would the potential yield be in terms of pounds of vegetables?

Austin is now the eleventh largest city in the United States with a population of nearly 850,000 (United States Census Bureau 2013). As the population continues to increase, new residential developments will push out east onto these agricultural lands and the available land for food growth will continue to diminish (City of Austin 2012, 5). Austin's City Council has put together a vision for future growth and land use in its Imagine Austin Comprehensive Plan (IACP) to get it to the year 2039. What the IACP does not do, however, is detail how much of Austin's agricultural land should be used to grow food. As more agricultural land is subdivided and developed the issue of food growth becomes a land use issue leading to another key question: What type of innovative land uses and development strategies could be used to retain the city's capacity for robust agricultural production?

If more land within Austin's city limits is put into food production there will be an accompanying growth in the local food economy (TXP, Inc. 2013, 23). The more money that is put into local businesses, in this case local farmers as well as other food producers and distributors, the greater the benefit will be for the local economy (Ladner 2011, 103). For local food growth to make the most economic and ecological sense

Austin would need to focus on crops that grow well in the central Texas climate. These foods, shown in Appendix A, could replace the current “imports” that come from outside the region that are sold in Austin (TXP, Inc. 2013, 23). The potential growth in the economy will be discussed in later chapters but both the APA and the USDA recognize the benefits to the overall local economy by increasing local food production and direct sales at farmers markets, farm stands, and community supported agriculture (American Planning Association 2007, 9) (Martinez, et al. 2010, 43)

This report seeks to answer the questions presented in the introduction that address food as a planning issue. It is the author’s hope that the inventory and analysis is a small step towards creating a stronger, sustainable, and more self-reliant local food system.

The focus of this report is lands that are in Austin’s full purpose jurisdiction and either zoned agricultural or have an agricultural land use. All lands identified to be suitable for future agricultural (AG) use are proposed to cultivate vegetables, those of which have proven to grow well in the Central Texas climate.

Addresses of the farms were found on their various websites and then searched on the Travis Central Appraisal District (TCAD) website, where the square footage and acreage of each farms’ parcel(s) was available. The parcel ID was then confirmed in Quantum GIS (QGIS) by a search in the attribute table and Google satellite imagery was used to further verify that the proper parcel was being used by locating visual evidence of farming.

An email was sent to each farm in order to determine how many acres each farm dedicated to food production. Not all farms responded with this information. If there was no response then a measurement was done in QGIS with the “Measure Area” tool. To ensure a reasonably accurate measurement, known areas from farms’ responses were

measured. For example, Urban Roots Farm replied to the inquiry stating they had 3.5 acres of farmed land. Using the measure area tool in QGIS and Google Satellite imagery, outlining the land that appears to be cultivated for food production on the Urban Roots parcel gave a total of 14,329.91 square meters. Using a Google area converter from square meters to acres, 14,329.91 square meters converts to 3.54 acres. That was deemed accurate enough to use the measure area tool for the farms that did not respond with the information.

Farms were also asked to estimate their annual food production in pounds but only one of the farms in Austin's full purpose jurisdiction keeps track of its food production that way. That farm's yield per acre was used to generate the annual yield for all Austin farms. This lessens the overall accuracy but still provides a reasonable estimate.

There is a farm in Austin's ETJ, Johnson's Backyard Garden, that has a similar annual yield, approximately 10,000 pounds per acre, to that which was used in this report's calculations. It is the author's opinion, that even though there was limited data available from the farms, the growth estimates serve their purpose by providing a starting point for discussion about the amount of food produced by Austin's farms.

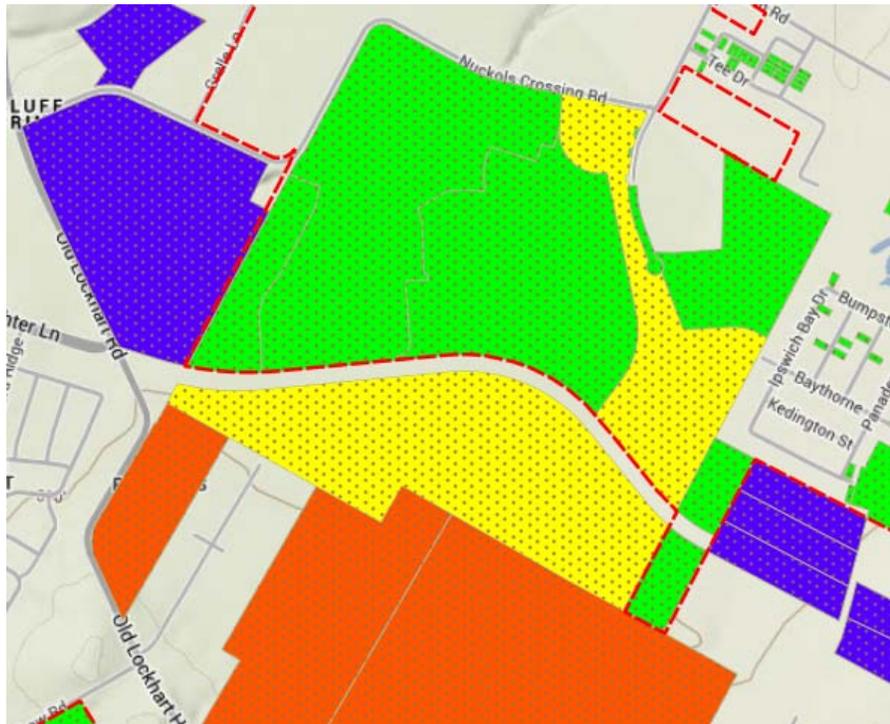
GIS data from the City of Austin was used to determine the parcels that are zoned for agriculture (AG). Using the attribute table in QGIS for the zoning shapefile and sorting the ZONING_ZTY column alphabetically puts all the AG parcels together. By selecting the parcels zoned AG you are able to see them highlighted in the map view. Austin's zoning authority only applies to its full purpose and limited purpose jurisdictions (City of Austin, FAQ, 2013). Since all of the land zoned AG fell within the full purpose jurisdiction there was no need to filter any of the information, unlike the land use data which follows.

Gathering the agricultural land use data was not as straightforward as gathering the zoning data. Land use data is available for Austin's full purpose, limited purpose, 2-mile ETJ, and 5-mile ETJ, though there is no distinction made between the jurisdictions in the land use data itself. The first step was to open the attribute table and sort the `d_Land_Use` column alphabetically. By selecting all the AG land uses and saving the selection as a new shapefile the information becomes much easier to use because the size of the file is reduced.

Once the AG land uses are isolated they can be viewed against the city jurisdiction shapefile. A vector analysis 'select by location' is the first step to determining which AG land use parcels belong to which jurisdiction. By selecting `AG_land_uses` that intersect Full-purpose jurisdiction, a few thousand AG land use parcels are highlighted that either fall within or touch a border of Austin's full purpose jurisdiction. By scrolling through the map you can remove parcels that clearly fall outside of the full purpose boundary but were selected by the QGIS analysis tool because the parcels shared a border with the jurisdiction. Some parcels straddle jurisdiction borders as shown in Figure 1.1. In that example the yellow portion is one parcel that has been highlighted. It falls in both the full purpose jurisdiction (FPJ) and the 2-mile ETJ. In this case a majority of the parcel appeared to be outside of the FPJ, so it was given to the 2-mile ETJ.

In addition to GIS data from the City of Austin, GIS information for the Geographic Regions was downloaded from the Environmental Protection Agency, Prime Farmland data came from the United States Department of Agriculture, and soils information came from the Capital Area Council of Governments (CAPCOG).

Figure 1.1: Parcel Located in Two Jurisdictions



Source: City of Austin GIS

This report is organized into five chapters and two appendices. Chapter one will review literature that is relevant to local food production and consumption in Austin. There are two reports that touch on some of the issues addressed in this report, *The Central Texas Foodshed Assessment* and *The Economic Impact of Austin's Food Sector*. In addition to these reports, there are a number of common themes in books about urban agriculture that will be drawn out and discussed as they are relevant to the growth of Austin's local food movement.

Chapter two will examine the current dedication of the City of Austin government and the citizens of Austin to growing the local food movement. In 2011, the City Council created a comprehensive plan in which local food production is frequently referenced. The Sustainable Food Policy Board recently rewrote the Urban Farm Code which will

have a great impact on the future of urban farms in Austin. In addition to work by the city government, there are a number of organizations that are contributing to food production at both a household and community level.

Chapter three will inventory the current agricultural production that takes place at Austin's farms and identify the agricultural land in Austin and its ETJ that could be used for future agricultural growth.

Chapter four will take the information gathered in chapter three and calculate the current production capacity on the available land uses for agricultural activity. There are a number of food growth options that are excluded in this report, as this is just part of a larger potential inventory, and these exclusions will be discussed in chapter four as well.

Chapter five will return to the questions that have been presented in the introduction. No matter what land is available and what the potential production capacity is, there will always be barriers to reaching that capacity. Suggested policy interventions to mitigate some of those barriers to expanding local agriculture will be discussed.

Appendix A is a list of the vegetables that are grown in Central Texas for sale at local farmers markets, farm stands, or CSAs. Appendix B highlights the requests by the Austin Urban Farms with regards to the Urban Farm Code rewrite and the subsequent outcome of those revisions.

Chapter One: Literature Review

No other previous study has examined the food production of Austin's farms or attempted to predict how much food Austin could produce if all available agricultural land was used for food growth. There is agricultural data available on a county wide level from the USDA. There is, however, nothing available on a city wide scale.

There are two reports that have local food or agriculture as a central theme, *The Central Texas Foodshed Assessment* written by Karen Banks for the Sustainable Food Center and *The Economic Impact of Austin's Food Sector* written by TXP, Inc. for the City of Austin. Both reports cite USDA data and use the Austin MSA, the five counties of Williamson, Travis, Burnet, Hays, Bastrop, as their study area.

There was also a land use inventory conducted as part of a City of Austin Community Inventory Report. The inventory details a lot of the background information that went into the writing of the Imagine Austin Comprehensive Plan. Part of that inventory details the amount of agricultural land use acres in Austin. This inventory information is from 2009, so it was done using 2008 land use information. At the time of the inventory there were 96,641.5 acres of AG land use in Austin. This report used the 2010 land use data which showed 82,400 acres, a loss of 14,241 acres in two years.

To help frame the work in this report, this chapter will take a look at the reports that focus on Austin, pull some of the major themes out of books about urban agriculture, and look at how some other food analyses have been conducted in other cities. One of the obvious limitations for any of the urban agriculture books is that they do not deal with Austin specifically. The type of food growth this report is suggesting does qualify as urban agriculture, though the identified lands are more of the peri-urban variety, so it is still important to examine what has succeeded in other cities and see if there could either

be a direct translation to Austin or if some modified approach to suit Austin's needs would work best.

AUSTIN THEMED WORKS

Central Texas Foodshed Assessment, Karen Banks 2011

Economic Impact of Austin's Food Sector, TXP, Inc. 2013

These reports bring together a couple of the major themes of the local food movement in Austin: the production of and access to local foods and the economic impact of the local food sector on Austin's overall economy.

The Central Texas Foodshed Assessment focuses on the production of and access to local foods. It recognizes the fragmentation of agricultural land due to developmental pressures. This has led to a decrease in the size of farms as the amount of cropland is declining. In reference to the peri-urban farm, Banks acknowledges that these farms can play an important role in meeting the food needs of the nearby community but that same proximity to the community often leads to both high land values and high utility costs (Banks 2011, 11).

One statistic that stands out, and this comes from the USDA, is that less than 1% (0.02%) of land in the five county area is used to grow produce (Banks 2011, 10). More specific to Travis County, the county in which Austin is located, is that the number of vegetables produced ranks Travis County 199th out of 234 Texas counties on which data was collected (United States Department of Agriculture 2013).

Another important theme, which is a continuation of the SFC report *Access Denied*, is the participation of low income customers in the local food system. Low income customers can be engaged, but need more experience with and education about local farmers (Banks 2011, 37). This is a point that has become more important of late,

and this is touched on in the discussion in chapter five, because of the disagreement on the best use of the fertile land on the East Side of Austin between leaders of the Hispanic community and local food advocates and farmers.

The biggest issue, however, is the limited access to and affordability of healthy foods for low income residents (Banks 2011, 33). The incidence of diabetes, heart disease, and obesity are much higher in the lower income African American and Hispanic populations than in the white community.

The TXP, Inc. report recommends making vacant land available for agriculture. It identifies land with agricultural exemptions, finding approximately 8,000 acres on 535 parcels (TXP, Inc. 2013, 27). The search in this report is much broader and in addition to identifying the potential AG lands, will estimate how much food could be grown on that land.

TXP, Inc. does not put a per pound value on locally grown food to be able to answer the question of how much each pound of locally grown food is actually worth. In addition, because the focus of the *Central Texas Foodshed Assessment* and the *Economic Impact of Austin's Food Sector Report* reach beyond Austin's city limits, any recommendation would require Austin to work with many different jurisdictions. By looking at just the City of Austin you can start asking the questions that are left unanswered from these reports: How much food is produced within Austin's city limits? How much food could be produced in Austin?

WORKS THAT ADDRESS THE LOCAL FOOD MOVEMENT

Continuous Productive Urban Landscapes (CPULs), Andre Viljoen, editor 2005

Agricultural Urbanism, Janine de la Salle & Mark Holland with contributors 2010

The Urban Food Revolution, Peter Ladner 2011

Food and the City, Jennifer Cockrall-King 2012

The Natural Step for Communities, Sarah James & Torbjörn Lahti 2004

In Defense of Food, Michael Pollan 2008

Local Food Systems, United State Department of Agriculture 2010

Policy Guide on Community and Regional Flood Planning, American Planning Association 2007

Problems with Global System

This issue was touched on in the introduction and is a common opener for any book on urban agriculture. Michael Pollan, who is not a planner but has food as a central theme in three of his books, takes on the issue of nutrients in his *In Defense of Food*. He argues that the current agricultural system is providing soils with only what is thought that plants need to grow: nitrogen, phosphorous, and potassium. Crops grown in this type of soil can live on this “fast food-diet of chemicals” but their nutritional quality is diminished and they become more susceptible to pests and diseases (Pollan 2008, 114-118).

Industrial agriculture also only grows a handful of varieties of high yielding plants with thousands of plant and animal varieties no longer being sold in grocery stores. The USDA has reported a decline in nutrient content of forty-three crops that it has tracked since 1950 (Pollan 2008, 118).

In *Food and the City* Jennifer Cockrall-King echoes Pollan’s points, even citing him at times, as she discusses the loss of types of foods noting that this loss of diversity is due to the mechanization of our current food system (Cockrall-King 2012, 44). The APA also discusses this lack of diversity and the importance of providing and having access to more varieties of foods than what the five corporations, who control ninety percent of

food distribution, decide is best (American Planning Association 2007, 3). The APA also makes note of the loss of the local food supply infrastructure due to the centralization of food production (American Planning Association 2007, 4).

The current system allows for more people to be fed than ever before, but also gives rise to greater levels of concern when food quality issues arise (American Planning Association 2007, 3). In 2010, there was E. coli bacteria found in prepared salads, resulting in a nationwide recall. Prepared salads, which are ready-to-eat, are vulnerable to contamination when irrigation systems are contaminated, or when manure compost that has been improperly treated is used as fertilizer. Because they are ready-to-eat, there is no cooking involved that would kill the pathogens (Ladner 2011, 4).

CPULs focuses on the energy used in terms of oil, the carbon footprint of meals, and discusses 'food miles' noting that that food is being transported further than ever (Paxton 2005, 41). Cockrall-King puts a number on it, stating that the average grocery store item travels over 1,500 miles from farm to consumer (Cockrall-King 2012, 51).

Consumer expectations have changed as a result of the industrial agricultural system. They have become accustomed to having food available to them out of season. CPULs cites a study in the Netherlands that indicated on average, vegetables produced in greenhouses require fifty-seven times as much energy as those same vegetables grown in the open air, in fields (Viljoen 2005, 28). This non-renewable energy use is compounded by the transportation of these goods. In order to withstand transit fresh produce is processed, has pesticides applied to them, or is packaged. These three things are avoided when food is produced and sold locally.

The list could go on. None of these books are suggesting that the global food system will not continue but the local system can provide alternatives and slowly

alleviate some of the stresses put on the environment that are a result of the industrial agricultural system.

Health and Food Security

This was touched on in the introduction as well and it ties into the global versus local argument. The USDA notes that more locally grown food does not necessarily equate to better individual health (Martinez, et al. 2010, 46). Price is often a limiting factor and even if foods are available and affordable it is incumbent upon the individual to make healthy food choices (Ladner 2011, 257). In CPULs it is argued that part of the issue of access to foods is that members of the community can see where, how and when crops are grown, thereby establishing a greater connection to and understanding of the food system (Viljoen 2005, 60).

Agricultural Urbanism references the Food and Agriculture Organization of the United Nations (FAO) prediction that by the year 2050 the world's food production must increase by 70 percent to meet the projected world population of 9.1 billion. The FAO also released information in 2009 noting that the number of people without sufficient food had surpassed one billion (de la Salle and Holland 2010, 95). In the US it is estimated that 49 million Americans are food insecure, often faced with the difficult decisions of buying food, paying for rent, utilities or medical care (de la Salle and Holland 2010, 95).

This compliments what Ladner finds among the poor, who often make the least expensive and easiest decision when it comes to food because of the need to save money to cover costs of rent and utilities (Ladner 2011, 200). The lack of access to decent food goes hand in hand with poor nutrition. Low-income neighborhoods have poorer health because of the high rate of consumption of foods that are high-fat, high-sugar, high-

sodium, that are readily available at convenience stores and fast food restaurants (Ladner 2011, 200).

Agricultural Urbanism suggests ways to focus planning around food production that would promote better community health. These plans are also reflected in the Imagine Austin Comprehensive Plan. One idea is to create urban forms that promote health, such as walkable communities (de la Salle and Holland 2010, 41). It sounds simple enough, but the implication for residents in lower income communities is being able to access something other than a corner store or fast food restaurant by foot. When grocery stores are far away from home and residents do not own a vehicle, low income residents are either force to take a cab, which increase the price of food right away, take public transportation which reduces the amount of food they can get home, or take their food home in the grocery cart from the store, which leads to the perception of the grocery store of being low quality when its carts are missing or strewn about nearby neighborhoods (Sustainable Food Center 1995, 12-14).

There needs to be local support for community gardens, demonstration gardens, and other forms of urban agriculture as key recreational, therapeutic, and community building activities (de la Salle and Holland 2010, 41). The benefits of community gardens are discussed by TXP, Inc., Ladner, *CPULs*, in the IACP, the *Natural Step for Communities* and *Food and the City*. The community gardens raise surrounding property values, the participants are healthier and have recently in Austin have been able to sell at local farmers markets, introducing an economic growth element (Ladner 2011, 185).

Local Economy

TXP, Inc. uses the five county MSA to define local with regards to food. The major take away from this report is the role that local food plays in Austin's overall food

economy. Local food grown directly for consumption brought in \$1.3 million in 2007 (TXP, Inc. 2013, 18).

Something stated in the Food Sector report, which is repeated in *Agricultural Urbanism, Urban Food Revolution*, as well the APA and USDA reports, is that farmers benefit most from direct to consumer sales, while going through distributors reduces their overall profitability. The direct sales could be through a farm stand, farmers market, or community supported agriculture (American Planning Association 2007, 10).

TXP, Inc. discusses the ‘multiplier effect’ of local food growth. This is a standard economic model where money that is spent on regional businesses is of greater benefit to the region than money spent on businesses based outside the region. If a variety of agricultural businesses can produce the foods that grow well in Central Texas and replace the “imports” of those same foods from outside the region, there will be a positive effect on the local economy (TXP, Inc. 2013, 20). In 2007 Austin MSA residents consumed about \$0.82 of direct agricultural products while the national average was at \$4.02. Very few of those sales were vegetables, as 70% of all agricultural sales in the Austin MSA were livestock (TXP, Inc. 2013, 12). The discrepancy between the national average and Austin MSA average and the limited sales of vegetables represents a lot of money that could be kept in the region with increased food growth. It would be of even greater benefit for Austin if that food growth and sales is occurring within the city limits.

There have been a couple of studies in cities in the Northwest United States that demonstrate the economic impact of local foods within the overall economy. In Seattle it was found that if 20% of the food dollars spent shifted to “locally directed spending” there would be a \$1 billion boost to the region’s economy. The assumption for these numbers is that when a farmer grows food for export, it generates \$1.70 locally for every dollar in sales. Farmers market sales produce different results. Every dollar in sales at a

farmers market from that same farmer will result in \$2.80 in local income (Ladner 2011, 103).

The City of Portland, Oregon found similar numbers. In their Food Study, they found that every dollar of local food sales generates \$2.66 for the local economy. This type of local, direct-sale activity allows farmers to bypass wholesale distributors and increase revenue by 200% to 250% (City of Portland 2009, 44). Another Portland study found that when school districts invested \$66,000 to purchase more expensive local foods, by paying 34 cents for chili instead of 30 cents, the result was an additional \$225,000 in spending. That was a 13% increase in spending on local lunches for the school district, but the local purchase meant that every dollar the school district spent, another 87 cents was spent in Oregon, making it a 1.87 multiplier (Ladner 2011, 103).

Agricultural Urbanism has a number of suggestions for increasing the impact of the local food economy, many of which are echoed in the *Imagine Austin Comprehensive Plan*. One of the most relevant suggestions to this research is the creation of an economic development strategy focused on agriculture and food (de la Salle and Holland 2010, 41). This plays into the suggestion from the APA that any economic evaluation should consider the impact of the local food economy (American Planning Association 2007, 9). One result of the global food system and the centralization of the processing and distribution is the loss of infrastructure on the local level. *Agricultural Urbanism* calls for the scaling up local food infrastructure, such as value-added processing and distribution centers (de la Salle and Holland 2010, 41).

Both the APA and *Agricultural Urbanism* support initiatives that are focused on increasing market access for local foods, such as chef-to-farmer networking events (American Planning Association 2007, 9) (de la Salle and Holland 2010, 41). This can produce the result of keeping farmers in business longer, helping them resist the urge to

sell their property due to development pressures, thereby preserving agricultural land for future generations, making this both an economic and ecological issue.

One of the biggest issues facing new farmers is finding the money required to acquire the land that is close to the communities which their food would serve. Local governments need to work with farmers to help them get the money to get access to agricultural lands (American Planning Association 2007, 10).

As far as economic benefits to the individual food producer are concerned, the results are dependent on the type of food growth. In 2009, Will Allen's two-acre Growing Power flagship farm in Milwaukee was producing fresh food for ten thousand area residents and generating \$250,000 in annual sales (Cockrall-King 2012, 231). SPIN (Small Plot Intensive) farming focuses on selling high priced, high end organic products. Studies have proven that on less than an acre of growing space, using SPIN methods can generate yearly revenues that could reach \$120,000 (Ladner 2011, 88).

Environment

When looking at the forecasted growth for the city of Austin it is easy to imagine how the current agricultural land could be eaten up by development. Ladner provides a number of good examples of how to either stop the growth outright on specific parcels or ways to tie agriculture into the seemingly inevitable creep of housing developments.

In the 1960s the province of British Columbia was losing between roughly 10,000 to 15,000 acres of some of their most fertile soil to residential development. They had the option of either stopping growth or losing the agricultural lands. In 1973, the provincial government of British Columbia created the Agricultural Land Reserve (ALR), which meant that subdivisions could not be built on land designated as agricultural. The lands were identified for the reserve based on the capability of the

lands, their current uses, local zoning, and input from public hearings. Ladner writes that public support for the ALR has stayed strong throughout the years, even from people who have tried to change their land use designation and people who protested against the original designation of the lands. The ALR was able to preserve 11.6 million acres of agricultural land in the province (Ladner 2011, 27-30).

There are more issues surrounding the ALR than will be discussed here, as issues are arising 40 years after the original designation. One issue is that the ALR was intended to promote viable farming, not as an urban containment boundary. The governments and residents will have to reassess the goals of the ALR to see if it is holding up to the original expectations of its creation (de la Salle and Holland 2010, 180).

Agricultural Urbanism recommends integrating urban residential and farm uses at the urban-rural interface (de la Salle and Holland 2010, 40). *Sustainable Cities* gives an example of a Swedish city that accomplishes the *Agricultural Urbanism* recommendation. There is a 25 acre farm that feeds urban families, while teaching visitors how to use an energy efficient approach to growing chemical-free vegetables and meat. A non-profit cooperative consisting of thirty households own and operate the farm. Almost all of the members have other jobs and work the farm on the weekends. The members are able to sell produce at their farm stand as well as at regional farmers markets (James and Lahti 2004, 133).

The name of the cooperative is Maskringen and their goal is not to produce large quantities of food, but to produce an optimum crop yield. The Maskringen cooperative is able to work with students from a nearby university to analyze food energy return for energy invested at the farm in order to attempt to further reduce energy use (James and Lahti 2004, 133-134).

There are a number of examples across the United States showing how a “conservation development” can work. In Madison, Wisconsin there is a 31-acre community-owned urban agro-ecology project called Troy Gardens. There are 30 co-housing units imbedded with a community garden, CSA, a prairie restoration, and edible landscaping (Ladner 2011, 54).

This site of this development had originally been put on the state of Wisconsin’s surplus land list, which meant it was likely to be sold to a private developer. Approximately four acres of the land had been used for farming by area residents for fifteen years. Fearing the possibility of losing the land a number of non-profit groups came together to form the Troy Garden Coalition who was then later joined by representatives from the University of Wisconsin after another 16 acre site was added to the surplus land list. The Coalition was able to design and propose an innovative land use that combined housing with open space and agricultural use. The city of Madison accepted the plan in 1998 and the Coalition and the state reached an agreement for a 50 year lease, with a provision to purchase the property. After years of fundraising and development work, the Coalition was able to purchase the property in late 2001 (Community Groundworks 2013).

On a larger scale in Serenbe, 30 miles from Hartsfield-Jackson airport in Atlanta, there is a 1,000 planned home community in which 80% of the farmland is permanently preserved. There is a working farm that is backed by a CSA and there are 35,000 acres that surround the development that are almost totally undeveloped (Ladner 2011, 54).

Prairie Crossing, outside of Chicago, is a 677-acre development within the 5,000-acre Liberty Prairie Reserve. The housing in the development occupies only 20% of the developed land. There is a 145 acre organic farm and the rest is reserved for wild habitat preservation. In all of these cases agriculture is an essential part of the community, along

with land preservation, energy efficiency, walkability, and green building (Ladner 2011, 50).

Education, Personal Choices, and Community Involvement

The growth of the local food system is going to require community input and involvement. The APA calls for the community participation in all aspect of planning. This has already been seen in Austin with the recent community debates of the Urban Farm Code revisions. Ladner write about the need for government interventions, planning, and rules and regulations. As seen with the Agricultural Land Reserve in British Colombia and Troy Gardens, there has to be coordination and communication among local government and the interested citizen groups. *The Natural Step for Communities* recognizes the ability of local municipalities in the United States to designate land for agricultural use and to set development limits (James and Lahti 2004, 129). This ties back into the environment but it is important to have community involvement when making this type of decision. Citizens need to be educated about the issues being addressed and they need to understand the consequences that current decisions can have on future generations.

No matter what happens with the local food movement, individuals will have to make the personal decisions that lead them to consuming healthy, nutritious food (Ladner 2011, 257).

Ten Principles of Agricultural Urbanism

In Agricultural Urbanism, much like the Charter of the New Urbanism established planning trends, de la Salle and Holland lay out their principles of agricultural urbanism that could guide cities and towns that seek to bolster their urban agriculture.

1. Take an integrated, food-and-agriculture system perspective

2. Create a rich experience of food and agriculture
3. Build the food and agriculture economy
4. Increase access to food
5. Educate about food
6. Manage to support sustainable food systems
7. Provide food and habitat for other species
8. Organize for food
9. Construct sustainable infrastructure for food and agriculture
10. Bring food and agriculture into the full suite of climate change solutions

These principles could be used as a checklist for Austin to assess itself on its progress in promoting the local food movement. Each principle represents a different set of planning issues that are related to the local food system.

OTHER CITY LAND INVENTORIES

A Review of Suitable Urban Agriculture Land Inventories Megan Horst 2011

Horst's review evaluates the Urban Agriculture Land Inventories of eleven cities/counties: Cincinnati, Cuyahoga County, Detroit, King County, Oakland, New York, Portland, Seattle, San Francisco, Toronto, and Vancouver. She emphasizes the need for any inventory to develop a standardized and repeatable process regardless of the inventory's objective. For each inventory she defines the lands considered, criteria for selecting land, the purpose of the inventory, who initiated the inventory, and the strengths of each inventory.

Should the City of Austin conduct a comprehensive Urban Agriculture Land Inventory, reviewing the process and results of these eleven inventories would be a good starting point. Karen Bank's *Foodshed Assessment* does touch on a number of issues that

would be important in a land inventory but the scale would need to be pulled back to encompass only Austin. Because of the nature of jurisdictional authority, even if Austin depends on food from surrounding counties, it can only implement measures that will affect food growing strategies in its jurisdiction.

Chapter Two: The Commitment of the Austin City Government and Austin Citizens to Local Food

The issue of local foods and local agriculture is already on the minds of the residents and the policy makers of Austin and as a result there is momentum building for more locally grown food. There is a farmers market available five days of the week and grocery stores and restaurants use local foods as a selling point. People outside of Austin are familiar with the local food scene and having local food adds another aspect of “Austin-ness” to an already popular Austin culture (TXP, Inc. 2013, 22). If Austin thrives on anything it is on being uniquely Austin and “Austin grown food” would fit into that mentality.

This demand for local foods is an indication of an increased interest in sustainability. As important as the word local has become in describing food, the word sustainability is key to the Imagine Austin Comprehensive Plan, so much so that the Austin City Council established “sustainability as the central policy direction of the plan” (City of Austin 2012, 7). The plan acknowledges the loss of open space, including agricultural lands, noting that the patterns of growth over the years were neither “environmentally or fiscally sustainable” (City of Austin 2012, 7). Austin’s population grew at more than 12,000 people per year from 2000-2010, and has not slowed down since, with an additional 25,233 new residents in 2011 and another 25,395 in 2012 bringing the total population to 842,592 (Austin Chamber of Commerce 2013).

LOCAL AGRICULTURE AND THE IMAGINE AUSTIN COMPREHENSIVE PLAN

A strong local food economy benefits the overall local economy, the environment, and community health (de la Salle and Holland 2010, 40). Austin’s City Council targeted

those three points in the goals set forth in the Imagine Austin Comprehensive Plan. A more robust local food system would help reach the following three goals:

Goal #1: prosperity and jobs

Goal #2: conservation and the environment

Goal #3: community health, equity, and cultural vitality.

As mentioned in the Literature Review, in 2007 locally grown food sold directly for consumption contributed \$1.3 million to the local economy (TXP, Inc. 2013, 18). The current production of vegetables in Travis County is so low that it does not even register as contributing to the agricultural economy (Banks 2011, 10). While the absence of food growth does not equate to demand there is a void to be filled as the Austin MSA only consumes \$0.82 of direct agricultural sales compared to the national average of \$4.02 (TXP, Inc. 2013, 18). The economic impact of the food sector would increase dramatically even if a small portion of Austin's available agricultural lands were dedicated to food production.

Goal number two, conservation and the environment, is addressed by the very nature of agricultural lands. As per Austin Code they are only allowed to have a maximum of 25 percent impervious cover or up 12,500 square feet, whichever is less, the soil is enriched, and if the main use is vegetable growth with limited pesticide use then the runoff is not harmful towards the watershed. Overdevelopment of current open space and agricultural lands could lead to destruction of wildlife habitat. Farms, if laid out properly, could be developed in a way that provides enough land for food growth and leaves part of their parcels undisturbed, thereby preserving wildlife habitat (Ladner 2011, 25-34). Or alternatively, farms could be a feature of a housing development, similar to some of the previously described conservation developments. The loss of farmland as a

result of development makes it more difficult for farms to meet the food needs of nearby communities, which leads to goal number three (Banks 2011, 5).

Health is a huge food related issue, with the national trends of overweight and obese youth being mirrored in Austin that were discussed in the introduction. Health is one of the most complicated planning issues surrounding local food production. If local food is grown using methods that allows the products to be more nutrient rich than their industrial counterparts and the access related issues of price and location of markets can be addressed, then local food can have a beneficial impact on the health of those in the greatest need of nutritious foods.

In addition to being able to apply local food and agriculture to reach the Imagine Austin goals, agriculture and local food are specifically addressed thirteen times in the Imagine Austin Comprehensive Plan Building Blocks. The following building blocks' policies come directly from the IACP. Emphasis was added by the author.

Land Use and Transportation (LUT)

LUT Policy 5

Create healthy and family-friendly communities through redevelopment that includes a mix of land uses and housing types, affords realistic opportunities for transit, bicycle, and pedestrian travel, and provides both community gathering spaces, *neighborhood gardens and family farms*, parks and safe outdoor play areas for children.

LUT Policy 23

Integrate citywide and regional green infrastructure to include such elements as preserves and parks, trails, stream corridors, green streets, greenways, *agricultural lands*, and the trail system into the urban environment and the transportation network.

LUT Policy 29

Develop accessible community gathering places such as plazas, parks, *farmers' markets*, sidewalks, and streets in all parts of Austin, especially within activity centers and along activity corridors including Downtown, future TODs, in denser, mixed use communities, and other redevelopment areas, that encourage interaction and provide places for people of all ages to visit and relax.

LUT Policy 34

Integrate green infrastructure elements such as the urban forest, *gardens*, green buildings, stormwater, treatment and infiltration facilities, and green streets into the urban design of the city through “green” development practices and regulations.

Housing and Neighborhoods (HN)

HN Policy 10

Create complete neighborhoods across Austin that have a mix of housing types and land uses, affordable housing and transportation options, and *access to healthy food*, schools, retail, employment, community services, and parks and recreation options.

Economy (E)

E Policy 18

Develop a sustainable local food system by encouraging all sectors of the local food economy, including production, processing, distribution, consumption and waste recovery.

Conservation and Environment (CE)

CE Policy 1

Permanently *preserve areas* of the greatest environmental and *agricultural value*.

CE Policy 3

Expand the city's green infrastructure network to include such elements as preserves and parks, trails, stream corridors, green streets, greenways, and *agricultural lands*.

CE Policy 5

Expand regional programs and planning for the purchase of conservation easements and open space for aquifer protection, stream and water quality protection, and wildlife habitat conservation, as well as *sustainable agriculture*.

CE Policy 13

Incent, develop, and expand the market for local and sustainable food, which include such activities as farming, ranching, and food processing.

City Facilities and Services (CFS)

CFS Policy 47

Extend existing trail and greenway projects to create an interconnected green infrastructure network that include such elements as preserves and parks, trails, stream corridors, green streets, greenways, *agricultural lands* that link all parts of Austin and connect Austin to nearby cities.

Society (S)

S Policy 6

Promote the availability of and educate the community about healthy food choices, including "slow food" (local food traditions, small-scale food processing, and organic agriculture) and nutritional education programs.

S Policy 7

Provide broad access to fresh foods, local farmers markets, co-ops, grocery stores, community gardens, and healthy restaurants in neighborhoods.

SYSTEMS ALREADY IN PLACE

There are already a lot of moving pieces in the local food movement. The Sustainable Food Center, Edible Austin, the Green Corn Project, the various departments and boards associated with the City of Austin, and a restaurant scene that utilizes local foods are all signs that Austin's local food movement has the capacity for further growth. What follows is a brief synopsis of what these and other organizations roles are and who they aim to serve.

The Sustainable Food Center

The Sustainable Food Center, a non-profit organization that “cultivates a healthy community by strengthening the local food system and improving access to nutritious, affordable food”, runs four farmers markets, educates volunteers on the process of establishing and running a neighborhood garden, teaches cooking classes, and works with school gardens, among other things. Two reports they have published were cited in this report and they have a very positive presence in the local food scene.

One result of the *Access Denied* report was a new bus route connecting residents to nearby grocery stores. One of the farmers markets, which is located on Austin's East side, where food access is limited, access SNAP (Supplemental Nutrition Assistance Program) vouchers and, at the writing of this report, was matching every twenty dollars spent on fruits and vegetables with another twenty dollars.

Their cooking classes are an important part of the education process with healthy foods. If an individual has access to healthy foods but has no idea how to prepare them

they will likely go with food options with which they are more comfortable. The cooking classes bridge the gap and provide families with a wider range of potential food to consume.

They have recently moved into a new building which has a 2.3 acre community garden that they estimate will be able to grow food for as many as seventy families (Sustainable Food Center 2013).

Edible Austin

Edible Austin runs a website and publishes a free magazine that share food stories from around the city, recipes, and promotes the local food scene by often running stories about the individuals that make up that scene. This type of publication raises the awareness of what is going on, both in and around Austin, and can educate both locals and tourists about local foods (Edible Austin 2013).

Sustainable Food Policy Board (SFSB)

With prompting from the Sustainable Food Center and Edible Austin, the Sustainable Food Policy Board was approved in 2008 by City Council members Mike Martinez, Lee Leffingwell and Laura Morrison, as well as Travis County Commissioners Sarah Eckhardt and Ron Davis. It is a thirteen member advisory body to the Austin City Council concerned with the improvement in the availability of safe, nutritious, locally, and sustainably-grown food. These foods should be available at reasonable prices for all residents, especially those with the greatest need, by coordinating the food related activities of city government, non-profits, and food and farming businesses (Banks 2011, 6).

The SFPB has become particularly relevant of late because the City of Austin Planning Commission charged the Board with developing the recommendations to

Austin's Urban Farm Code, which will be discussed more in chapter five (SUAGG 2013).

The Green Corn Project

The Green Corn Project is a non-profit that helps families to establish organic, at home gardens. They estimate that they have helped over 160 families start or re-start their own gardens with over eighty percent of those families maintaining their gardens for two years or more. Their focus is on elderly, low-income, and disabled community members in addition to elementary schools, community centers and shelters in high need areas of Austin. They refurbish the beds they help plant for four seasons (Green Corn Project 2013).

Resolution Gardens

Resolution Gardens is a project of Austin Green Art that seeks to transform home owners' yards into vegetable gardens for greater access to healthy, nutritious, locally grown food. They have six active sites, totaling 17,600 square feet (.40 acres). This 'de-centralized urban farm' has sold chard and lacinato kale at Wheatsville Co-op, an Austin based organic and natural food store (Resolution Gardens 2013).

Food is Free

Launched in early 2012, Food is Free seeks to connect neighbors by lining their streets with front yard community gardens in an effort to become less reliant on the current agricultural system. They seek to create models for growing food in unused public spaces that provide a sense of community and access to organic, fresh, healthy foods (Food is Free 2013).

Urban Patchwork

Urban Patchwork is a non-profit neighborhood farm network that offers start-up programs and workshops on nutrition. They assist residents and businesses in hosting farm plots in their yards for exchange for fresh veggies and other opportunities to reduce the cost of living (Urban Patchwork 2013).

HOPE Market

Established in 2009, HOPE market was the first market open on Sundays and since the recent growth of Austin's farmers markets is the longest running farmers market in East Austin. HOPE Market seeks to make a connection to the Hispanic community by offering avocados, limes, tortillas, and peaches, in addition to nopales and epazote, which are both traditional Mexican food items. They are also in the process of establishing a bike powered, mobile food vendor to increase access to fresh, local foods. HOPE market is selling food from the Festival Beach Community Garden, an enterprise which could create opportunities for more community gardens to sell their foods (Landeros 2013).

Texas Young Farmers Coalition (TXFYC)

The TXFYC is an Austin based coalition whose goal is to build connections between young farmers throughout the state. The hope of these connections is to increase food awareness, encourage the exchange of ideas, and create relationships among farmers whose collective whole is greater than individual parts. The TXFYC understands that in order to have more farms, there needs to be more farmers, and that by increasing the number of young farmers all the things that local food movements hope for will occur: increased food security, increased food awareness, and the growth of stronger relationships between local food and local economies (Texas Young Farmers Coalition 2013).

Moontower Community Agricultural Co-op

In what would be Austin's first food hub, the Moontower Co-op seeks to create direct relationships between farmers, producers, and consumers (Moontower Co-op 2013). Moontower would establish relationships to distribute to institutions like schools, hospitals, and corporate cafeterias, who would buy in bulk all season long. They would also help with the storage of produce, so that markets are not flooded with seasonal vegetables that are harvested at the same time, which would help with food distribution and reduce food waste (Texas Young Farmers Coalition 2013).

SUMMARY

There is strong evidence of commitment to the local food movement from both the City of Austin government and other citizen led organizations. While the current economic impact of the local food movement is tiny, the capacity exists to increase the scale of local food production.

The non-governmental organizations highlight the need for grassroots movement in establishing the access to and the culture around healthy food choices. The organizations that focus on bringing food to the people rather than getting people to the food help eliminate some of the transportation issues associated with lower-income residents' access to healthy foods.

Chapter Three: Current Agricultural Production and Agricultural Land in the City of Austin and the ETJ

At the writing of this report there were five farms that grew vegetables in Austin’s full purpose jurisdiction. There were three pieces of data to be collected from these farms:

1. the acres of the parcel on which the farm was located
2. the number of those acres that were used for growing crops
3. the annual yield, in pounds, of vegetables grown on that land

The acres of each parcel were gathered from data available on the Travis Central Appraisal District (TCAD) website. Two farms responded with their farmed land acreage. The other three farms have an estimate of farmed land acreage collected using Google satellite imagery in QGIS. Only Urban Roots kept track of their annual yield.

Table 3.1: Austin Farm Data

Farm	Acres parcel	Acres farming	Percent in “use”	Annual yield in lbs
Boggy Creek Farm	5.06	2.85†	56.32	Not available
Springdale Farm	4.84	3	61.98	Not available
Rain Lily Design	4.03	0.29†	7.20	Not available
Urban Roots	9.11	3.5	38.42	36,000
HausBar	1.80	0.37†	20.56	Not available
Total	24.86	10.01	40.27	

†calculated from Google satellite imagery in QGIS

LOCATION OF AUSTIN FARMS

All of the farms in Austin are located east of IH-35, which is generally regarded as being better land for farming due to the lands being part of the Texas Blackland Prairie. Four of the farms, Boggy Creek, Springdale, Rain Lily, and HausBar, are in between Pleasant Valley Road and Springdale Road and are located in the Govalle Neighborhood Planning Area. All four of those farms are considered urban farms. Urban Roots is east of State Highway 183, is not associated with a neighborhood planning area, and is not considered an urban farm.

None of the farms are zoned for an agricultural use.

Table 3.2: Farm Zonings

Boggy	Springdale	Rain Lily	Urban Roots	HausBar
SF-3-NP	CS-MU-CO-NP	SF-3-NP	SF-2	SF-3-NP

See Figure 3.1 for detail of the farm locations.

FARM SOIL TYPES AND PRIME FARMLAND

There are two soil types that the farms in Austin sit upon: Bergstrom series and Bastil series.

Boggy Creek Farm sits on the border of the two soil series. Only HausBar is completely in the Bastil series while the other farms rest on the Bergstrom series.

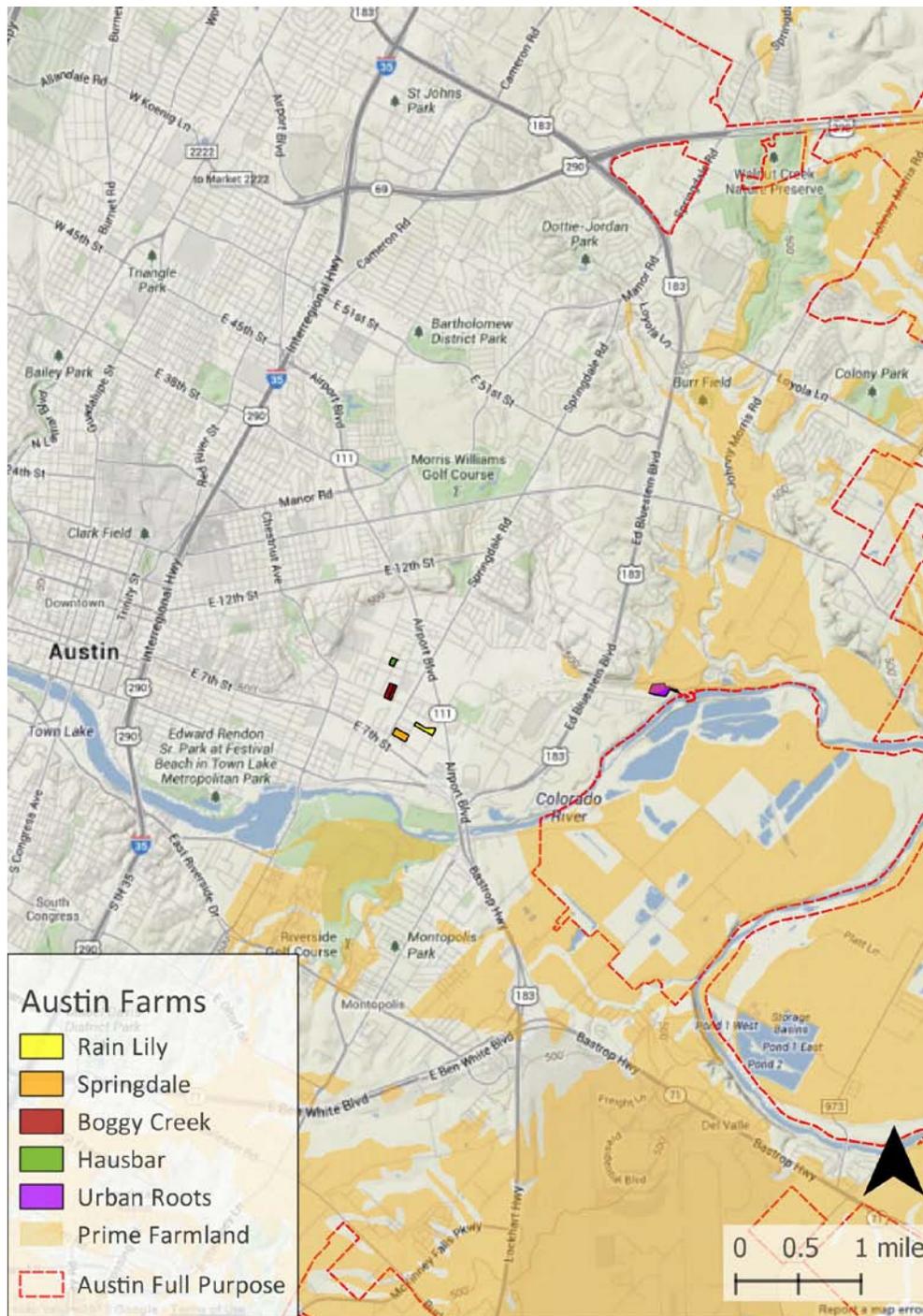
More generally, all of the farms are in the Texas Blackland Prairie Geographic Region. The soils in this region are known for being deep and rich with organic material, making them valuable for agricultural use (City of Austin 2013, 5).

Table 3.3: Soil Types

Farm	Bergstrom	Bastil
Boggy Creek Farm	yes	yes
Springdale Farm	yes	no
Rain Lily Design	yes	no
Urban Roots	yes	no
HausBar	no	yes

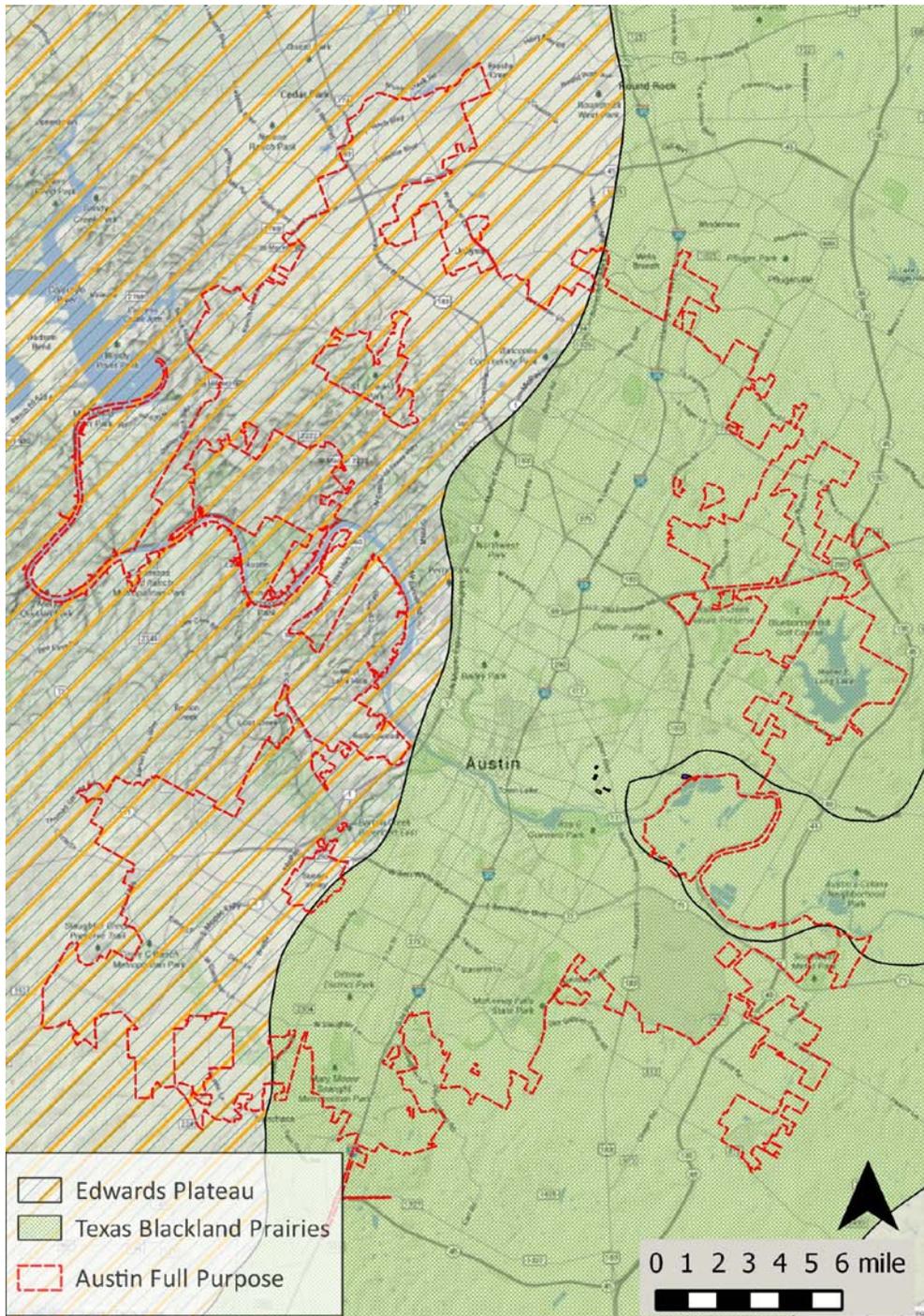
Only Urban Roots Farm is in Prime Farmland. That is due to the development around the other farms. The farms are all comparable with regards to soil type so it would seem likely that if the other four farms were not embedded in a surrounding neighborhood, they too would be on prime farmland. The definition of prime farmland states that 'it is not urban or built-up land', thereby eliminating all farms located in the Govalle Neighborhood (United State Department of Agriculture 2013).

Figure 3.1: Farm Locations in Austin’s Full Purpose Jurisdiction



Source: City of Austin and USDA

Figure 3.2: Blackland Prairie and Edwards Plateau In Austin's FPJ



Source: City of Austin and EPA

SUMMARY OF FARMS

There are 24.86 acres of farm parcels within Austin's full purpose jurisdiction. Of those 24.86 acres, 10.01 acres are used for food production, or roughly forty percent. Urban Roots Farm is the only farm to keep track of its annual food production in pounds. They produced 36,000 pounds of food last year for a rate of 10,285.71 pounds per acre.

All of the farms are located east of IH-35 and in such close proximity that four of the farms are located in the same Neighborhood Planning Area. The greatest distance between any two farms is about two and a half miles, with only Urban Roots Farm sitting east of SH-183 and by just over half a mile. All of the farms share similar soils.

Because of the similar soil type, the number 10,285.71 pounds per acre from Urban Roots Farm could be used for making predictions for all of Austin's farms. Because of the smaller size of two of the farms and for ease of calculation and discussion, this number will be rounded down to 10,000 when making predictions for the annual yield of all of Austin's farms.

AUSTIN'S AGRICULTURAL ZONING

There are only two parcels of land within Austin's full purpose jurisdiction that have an Agricultural (AG) Zoning (City of Austin GIS 2013). One parcel is the Bull Creek Park and Greenbelt and the other is the Switch Willo horse stables. Neither site appears to be headed towards food production anytime soon.

There are also two parcels that are zoned Agricultural Neighborhood Plan (AG-NP). These two parcels, like much of Austin's land west of IH-35, are more suited for grazing than food production and are designated to be zoned Rural Residential based on City of Austin Future Land Use data.

The City of Austin does not zone land in its ETJ so it is not possible to examine AG zoning outside of the city's Full and Limited Purpose Jurisdictions (City of Austin

2013). There is, however, information available on the land uses in Austin’s Full and Limited Purpose Jurisdictions as well as Austin’s 2-mile ETJ and Austin’s 5-mile ETJ. The AG land uses in all of these areas will be detailed in the next section.

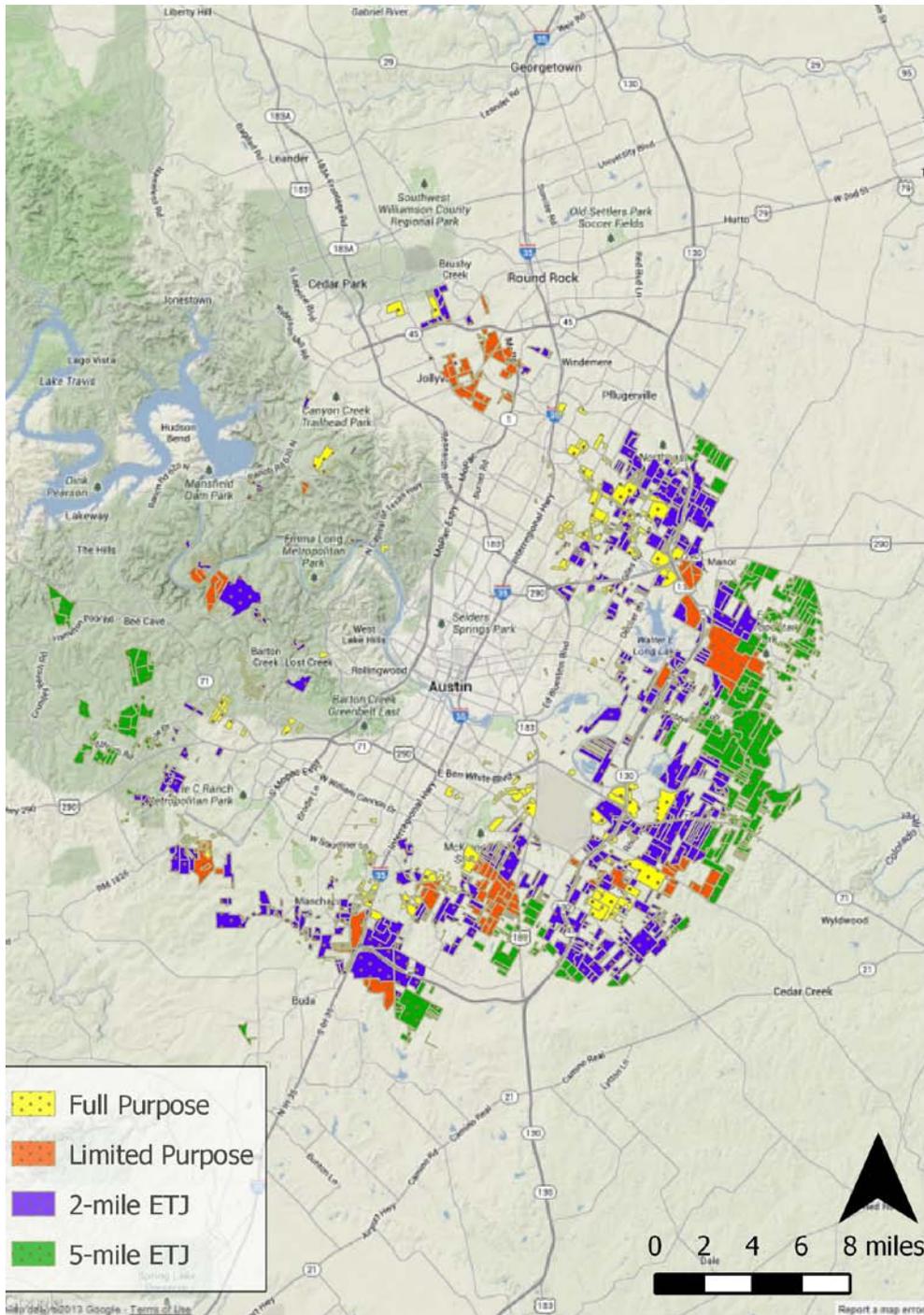
AGRICULTURAL LAND USE IN ALL JURISDICTIONS

There are 4,508 parcels designated as an Agricultural Land Use which total 82,400 acres. The breakdown per jurisdiction is shown in Figure 3.3 and Table 3.4.

Table 3.4: Agricultural Land Use per Jurisdiction

Agricultural Land (LU 900)	Parcels	Acres	Average Parcel Size
Full Purpose	2,381	10,279	4.32
Limited Purpose	205	11,976	58.42
2-mile ETJ	1,686	38,836	23.03
5-mile ETJ	406	21,528	53.02
Total	4508	82,400	18.28

Figure 3.3: Agricultural Land Use in all of Austin's Jurisdictions



Source: City of Austin

AUSTIN'S FULL PURPOSE AGRICULTURAL LAND USE

Despite the lack of parcels that are zoned AG in Austin's full purpose jurisdiction there are 2,381 parcels on 10,279 acres that have an agricultural land use. These AG land uses appear in a wide range of zonings due to the wide variety of zonings that allow for an AG land use.

There is little distinction between Agricultural land uses and Undeveloped land uses. The metadata provided for the Land Use 2010 data set states that Land_Use_2010, the selection used to collect this information, is "the specific use of the parceled land in year 2010". The data set was last updated on February 1, 2012. There is also a column called General_Land_Use_2010, which the metadata describes as "the general use of the parceled land in 2010". All of the parcels that have a Land Use of Agricultural (coded 910) have a General Land Use of Undeveloped (coded 900).

This lack of distinction is confirmed by the City of Austin Community Inventory Report which states "undeveloped land can be classified as agricultural, even though it is tough to identify agricultural uses from aerial photos." (City of Austin 2013, 5)

There are hundreds of parcels that are small lots in subdivisions at a stage in the development process that shows them past any intended agricultural use. In the next section the number of AG land use parcels within Austin's full purpose jurisdiction is reduced based on its qualification of being part of a subdivision.

Boggy Creek Farm is the only farm in Austin that has an AG land use listed in the 2010 data.

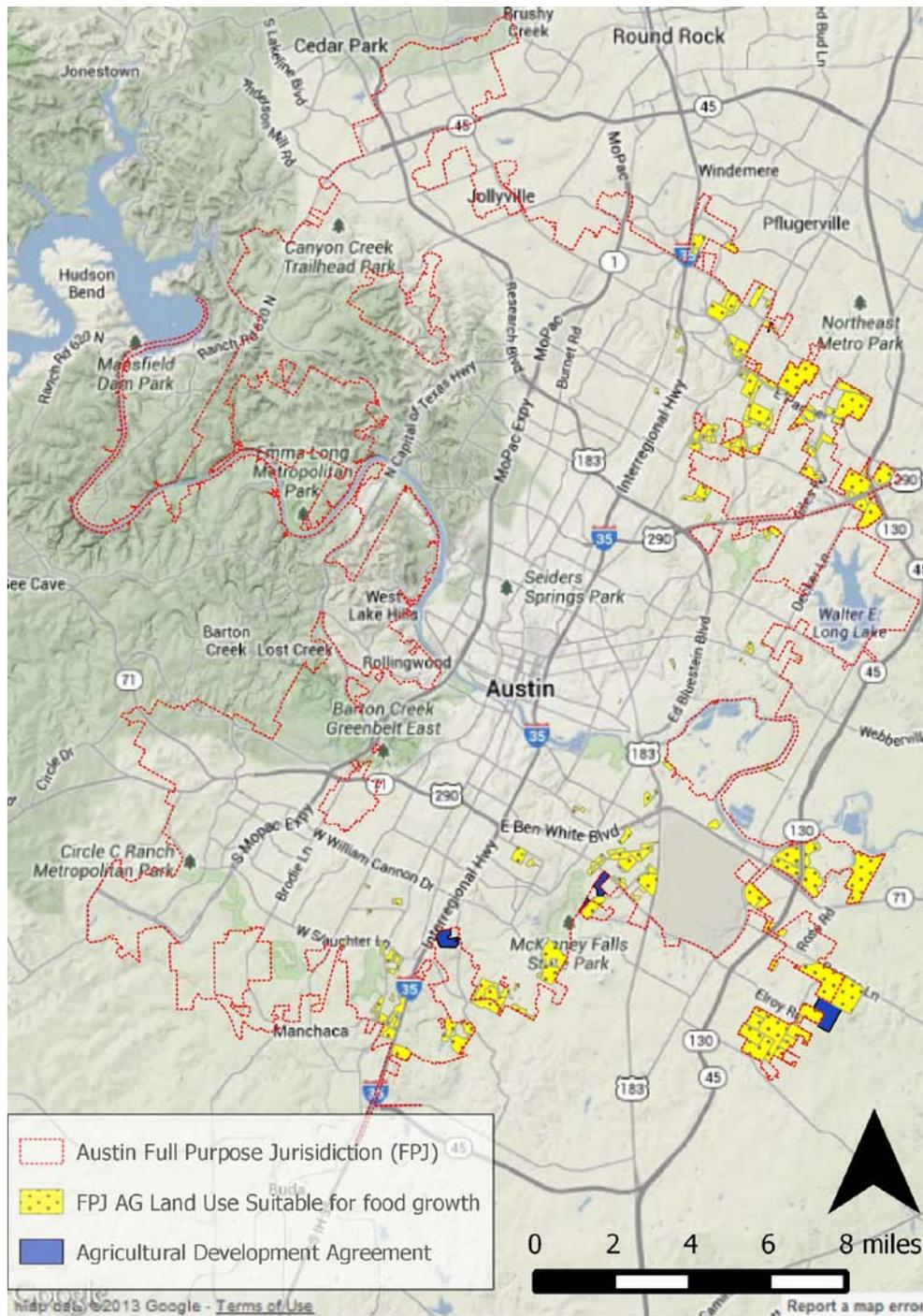
REDUCING AUSTIN'S AG LAND USE

There is no reason to assume that land that has already been subdivided and has the streets paved will become anything other than residential. Recent aerial images show the subdivisions either fully or partially developed where these lots are located. Because

of this the number of parcels can be reduced from 2,381 to 452. Most of the new homes will sit on lots that are a tenth of an acre so the overall AG acreage is only reduced from 10,279 to 10,034.

A further reduction can be made based on which geographic region the parcels are located. There is a vertical division in Austin where almost everything east of Loop-1 MoPac is Texas Blackland Prairie and the lands to the west are Edwards Plateau. As mentioned earlier in this chapter, the soils of the Texas Blackland Prairie are well suited for crops while the Edwards Plateau is not (City of Austin 2013, 5). By eliminating the ninety-eight parcels located in the Edwards Plateau the total available AG parcels drops to 354. The total acreage is reduced to 8,553.

Figure 3.4: Agricultural Land Use that is Suitable for Food Growth FPJ



Source: City of Austin

While the overall acreage is not greatly impacted, this does affect the average size of each AG land parcel. Before subtracting all parcels that did not meet food growth criteria there were 10,279 acres divided among 2,382 parcels for an average parcel size of 4.31 acres. With subdivision and Edwards Plateau parcels removed there are 8,553 acres divided among 354 parcels for an average parcel size of 24.16 acres, increasing the average size by almost 20 acres.

SUMMARY OF AVAILABLE AGRICULTURAL LAND

There are two parcels with AG zoning and two parcels with AG-NP zoning. These four parcels will not be considered for potential food production.

After applying the criteria of eliminating subdivided parcels and parcels found in the Edwards Plateau, there are 8,553 acres of agricultural land use on 354 parcels in Austin's full purpose jurisdiction. These numbers will be used when making calculations for potential agricultural production.

MORE POSSIBILITIES FOR FOOD GROWTH THAT WERE NOT CONSIDERED

There are many other types of urban agriculture that could help increase food production in Austin but do not fall within the scope of this report. A brief discussion of some of the other lands and methods of food production follow.

#1 Lands that are neither zoned AG nor have an AG land use

The City of Austin allows for special permitting Urban Farm use on nineteen different land use zonings (City of Austin 2008).

Table 3.1: Zonings that allow Urban Farms

Residential	
RR	Rural Residential District
SF-1	Single Family - Large Lot
SF-2	Single Family - Standard Lot
SF-3	Family Residence
SF-4A	Single Family - Small Lot
SF-4B	Single Family – Condominium
SF-5	Urban Family Residence
SF-6	Townhouse & Condominium
MF-1	Multifamily - Limited Density
MF-2	Multifamily - Low Density
MF-3	Multifamily - Medium Density
MF-4	Multifamily - Moderate Density
MF-5	Multifamily - High Density
MF-6	Multifamily - Highest Density
Commercial	
NO	Neighborhood Office
LO	Limited Office
GO	General Office
LR	Neighborhood Commercial
GR	Community Commercial

There is a discrepancy between the zoning guide and the permitted use chart – the permitted use chart shows 32 different zoning uses that are allowed to develop either Urban Farms or Community Gardens. The recent Urban Farm Code rewrite determined that an urban farm use would be allowed in “every zoning district”.

Four of Austin’s five farms are on single-family lots. None of the farms are on land that is zoned AG and only one has an AG land use. There is a lot of potential for urban agriculture on non-AG lands within Austin, but that would be a separate inventory and it is not the focus of the report.

#2 Community and Neighborhood Gardens

Community and neighborhood gardens are important to the production and promotion of local foods. It is estimated that they produce 100,000 pounds of food a year (Imagine Austin 2013). There is a growing economic interest for some community gardens that will be able to sell their foods at market, and donations they make to local food banks are important because there is often have a shortage of fresh foods (Landeros 2013 & Banks 2011). Even though the overall production of community gardens is close to that of Austin’s farms, this report seeks to identify a larger scale of production than that which community and neighborhood gardens could provide. Most of the community gardens are managed by a group of volunteers. There are jobs at the SFC and City of Austin dedicated to sustainability and food production, but in terms of creating an agricultural workforce from the aspects of production and distribution, the gardens are negligible.

#3 Other Types of Urban Agriculture

There are number of grassroots movements in Austin that are contributing to the total number of square feet of farmed land. Urban Patchwork, Resolution Gardens, Food

is Free, and the Green Corn Project all work with homeowners to either transform their front yards into gardens to share with neighbors or work with them to set up their own backyard gardens for food growth. Gathering the number of acres put into production and the amount of food produced by these various organizations would be a time consuming but worthwhile endeavor, however, it is outside the scope of this report

#4 Farms in the ETJ

Green Gate Farms and Johnson's Backyard Garden sit just outside of Austin full purpose jurisdiction in the 2-mile ETJ. Those two farms would add significantly to the current food production in Austin because they farm at a larger scale than Austin's urban farms. Their data will be used in some discussion but they are not considered for any full purpose jurisdiction calculations.

#5 Agricultural Development Agreement

This is another jurisdiction which is specific to agriculture. A City of Austin Planner describes the agreement as such:

An Agricultural Development Agreement (ADA) is a contract between the City of Austin and a private property owner. The purpose of an ADA is to delay full-purpose annexation by the City of Austin in exchange for assurances that the land will remain for agricultural purposes. If the land owner decides to develop the land for other purposes, they may do so under specific development regulations and the City will then be able to proceed with annexation.

Viewing the Agricultural Development Agreement shapefile in QGIS shows it as one feature which displays as five separate parcels totaling 409 acres.

Chapter Four: Current Production Capacity on Land Uses Available for Local Agricultural Production

The following calculations are rough estimates based on the available information on the size and annual food production of Austin’s farms and the amount of agricultural land in the City of Austin’s full purpose jurisdiction.

CURRENT FOOD PRODUCTION

Table 4.1: Austin Farms’ Food Production Data

Total estimated acres in production of Austin farms	10.01 acres
Approximate yield per acre	10,000 pounds
Total estimated annual yield from Austin farms	100,000 pounds
Total acreage of Austin’s farms’ parcels	24.86 acres
Percent of farm parcels producing food	40%

Though there was only one farm that kept track of their food production in pounds, 10,000 pounds per acre number is a reasonable baseline based on data collected from another Austin area farm. Johnson’s Backyard Garden has 205 total acres, twenty of which are in Austin’s 2-mile ETJ and another fifty that are in Cedar Creek, which is about 30 miles east of downtown Austin. They estimated that they farm 150 acres and that they grew approximately 1.5 to 2 million pounds of produce, for an average of 10,000 to 13,333 pounds per acre (Johnson’s Backyard Garden 2013). Taking the low end keeps the average close to the production at Urban Roots Farm.

Not all farms are going to produce at the same rate. Some small scale farms grow at a higher per acre intensity than larger farms (Ladner 2011, 90). Without knowing if

farms are producing year round and how intense their production is, an exact estimate is tough to produce. It is the author’s opinion that the 10,000 pounds per acre estimate for all of Austin’s farms would be on the high end, but it is satisfactory for the purpose of this report.

How Many People Does This Feed?

NPR reported that the average American is estimated to consume 415 pounds of vegetables per year. The top three vegetables consumed are potatoes, corn, and tomatoes (Aubrey 2013). The 415 pounds seems a little inflated, considering that thirty pounds of potato consumption comes from French fries as well as the lack of clarity from examining the USDA data that NPR used if consumption equates to actual eating or purchase of these vegetable totals that include fresh, frozen, and canned vegetables.

415 pounds per year equates to a little over a pound of vegetables per day (1.13 pounds). For ease of discussion, this report will lower the average consumption of vegetables to one pound per day. Using one pound per day as the measure, in one year Austin farms can provide vegetables for 273.97 people.

POTENTIAL FOOD PRODUCTION

Table 4.2: Potential Food Production

Total agricultural lands that met criteria	8,553 acres
Forty percent of available AG lands	3,421.2 acres
Potential production of available AG lands	34,212,000 pounds per year

If all development stopped on the AG lands in Austin’s full purpose jurisdiction and was put into food production, and the same percent of each parcel was used to

produce food as Austin’s farms currently use, this is how much food could be produced. Is this a realistic scenario? No. It does, however, provide a glimpse of how much AG land Austin has that could be used to grow food and how much it needs to keep undeveloped in order to provide more food for its citizens.

Table 4.3 shows some projections at different rates of production; or at different rates of keeping land undeveloped. The “percent in production” is referencing the 8,553 acres of identified AG land.

Table 4.3: Food Produced Based on Percent of AG Land in Production

Percent in Production	Pounds of Food	People fed at 365 pounds per
100	85,530,000	234,329
75	64,147,500	175,747
50	42,765,000	117,164
40	34,212,000	93,732
25	21,382,500	58,582

OTHER AGRICULTURAL LAND CALCULATIONS

Any scenario of Austin producing enough vegetables for all of its citizens would have to include land outside of its full purpose jurisdiction. Applying the criteria of eliminating all AG lands located in the Edwards Plateau eco-region produces the numbers seen in Table 4.4.

Table 4.4: Parcels and Acreage of AG Land outside of Austin’s FPJ

Jurisdiction	Parcels	Acres	Average parcel size
Limited Purpose	104	8,193	78.78 acres
2-mile ETJ	896	32,575	36.36 acres
5-mile ETJ	338	18,125	53.62 acres
Total	1,338	58,893	44.02 acres

That adds another 58,893 acres of available AG land to the 8,553 identified for the FPJ.

Numbers for pounds of food produced and people fed applying the same calculations done to the AG land in the FPJ for percent use are shown in Table 4.5.

Table 4.5: Pounds of Food

Percent in Production	Pounds of Food	People at 365 pounds per
100	588,930,000	1,613,507
75	441,687,500	1,210,102
50	294,465,000	806,753
40	235,572,000	645,403
25	147,232,500	403,375

It is eye opening to think that it would take fifty percent all of the AG land that meets the criteria set forth in this report, producing at 10,000 pounds per acre to produce enough food for 923,917 people (806,753 plus the 117,164 from the full purpose jurisdiction). That takes care of Austin’s current population, but does not take into consideration the amount of time and financial investment it would take to get those lands

up to that scale of production. It also does not account for loss due to spoilage or damage in transport. It is a crude number meant to start the conversation that agricultural lands need to be preserved if Austin wants to produce more food.

It is important to consider the impact the land in the ETJ could have on Austin's food production. While the main focus of this report was on Austin's urban farms, if Austin were to reach its maximum food production potential peri-urban farms would have to be a big part of the equation. Urban Roots Farm is peri-urban, as well as Green Gate Farms and Johnson's Backyard Garden, which are located in the 2-mile ETJ. In Cuba, peri-urban farms were identified as a necessary part of the large scale response to their threatened food security when their ability to import enough for its residents was lost (Diaz 2005, 140).

SUMMARY

The five farms in Austin's full purpose jurisdiction produce an estimated 100,000 pounds of food a year. This is the same amount of food that is produced by the twenty-eight community and neighborhood gardens in Austin (Banks 2011, 43 & Imagine Austin 2013).

If all the available AG lands in Austin's full purpose jurisdiction were producing at the same rate as Austin's farms and using the same percent of land (40%) for production as Austin's farms, then 34,212,000 pounds of food per year could be produced. This would be a 342% increase in production.

Opening up the production to all the available AG lands in Austin's city limits (Full, limited, and extra-territorial jurisdictions) and keeping the same 40% of AG land used for production, 269,784,000 pounds of food could be produced. That would provide vegetables to 739,134.25 people at an average of one pound per day per person.

Chapter Five: Conclusion, Barriers, and Policy Interventions to Expanding Local Agriculture

The findings and discussion below are based on the evaluation of the current farm and agricultural land use data, as well as readings and other literature about Urban Agriculture and how different planning theories and practices could apply to Austin.

Local food production is important in the context of health and nutrition but there are a number of qualifying factors to make a more direction connection between the two. Even if local grocery stores were to distribute local foods, which could provide a higher nutrient level than those coming from the industrial agriculture system, if the residents in highest need of those nutrients do not have access to those stores then, to them, the production of those foods is irrelevant. This is perhaps the biggest challenge in the local food movement. The production of foods on its own does not resolve the issue of access.

In the past year a community market has opened that addresses that specific issue. The Rosewood Community Market opened in January of 2013 in the heart of Austin's East Side, which by USDA definition was a food desert. It was founded through a small grant from the City of Austin that was made available through the Affordable Care Act. That money, plus a start-up loan through the micro lender PeopleFund, allowed the owners to rebuild the 1819 Rosewood Avenue location to set up a market selling farm-fresh as well as conventional produce and healthy snacks (Rosewood Community Market 2013).

The Rosewood Community Market is a not-for-profit venture and is working to become East Austin's first co-op. They are located in an area that used to be host to many small groceries, but since the late 1980's has lacked the healthy food options that a grocery can offer. The Rosewood Community Market accepts SNAP and Lone Star Card, and the owner will occasionally take ten percent off the top of sales (Edible Austin

2013). This market is an example of the type of business venture that needs to occur to mitigate access issues on the East Side of Austin and other areas in need of healthy food options. The local food movement is not just about food production. It is important to have distributors that provide access to those foods as well.

For a city with 174,080 acres, having 30 acres of farms growing food is a low number. There is however a lot of land that is available for food growth as well as barriers to putting that land into food production. One issue is ownership of the agricultural land. Who owns the land and what do they want to do with it? Are they sitting on it until it makes sense to subdivide and put houses on it or do they intend to put it to agricultural use?

Austin's community gardens are estimated to produce 100,000 pounds of vegetables a year, which is the same as the estimated amount produced by the farms within Austin's full purpose jurisdiction. This report is not seeking to diminish the importance of Austin's farms when comparing the production of the farms to that of the community and neighborhood gardens, nor when estimating the number of people that could have their vegetables provided solely by the farms. It is not unusual for a metropolitan area to get more food from its community gardens. In 2008 in Philadelphia, the fifth most populous city in the United States, community gardens produced more food than the farmers markets and urban farms sold (Philly Harvest 2008, 8). The value of the farms is not measured by their annual yield. The value can be seen when referring back to the IACP goals of:

1. Prosperity and jobs
2. Conservation and the environment
3. Community health, equity, and cultural vitality

The current farms provide jobs, the farming improves the quality of the soil, and there is no true measure of connecting the community to their food source and of being able to eat foods that are literally minutes out of the ground or off the plant. Add to that the location of these farms in neighborhoods that have been traditionally low income, where the access and visibility to how food is grown becomes part of the community. Those are the benefits from the perspective of a local food proponent. Recent community meetings regarding the Urban Farm code rewrite, however, have shown that not everybody agrees on the best use for the lands in these neighborhoods with quality food growing soils (Toon 2013).

The IACP says that there are thirty-three farms with cultivated land within Austin's City Limits. Within the full purpose jurisdiction there are about 10 acres, and adding in the two farms in the ETJ, Green Gate Farms (~ 2.3 acres) and Johnson's Backyard Garden (~18.2) the total is bumped up to 30.5 acres. There are 67,446 acres on AG land use in all of Austin's jurisdictions that were deemed suitable for the growth of produce. It goes without saying that putting that land into production would take a lot of time, energy, and money. If Austin were seeking food independence, it would be years in the making. The shortage of farmers, the price of the land, the infrastructure and labor needed would make this nearly impossible.

That does not mean that Austin should not take steps to reduce its dependence on food from outside of the region. A high dependence on foods from outside the region equates to high vulnerability if an event takes place that disrupts the flow of food into the city. Every piece of agriculture counts, whether it is a backyard garden, a community garden, half an acre on an urban farm, or twenty acres on the city fringe. As seen by the examples describe earlier in the report, there are innovative land uses that could allow land to still be subdivided without having a total loss of the agricultural land.

The Urban Farm Code and Issues with Land Use

There could be a separate report dedicated to the process of the rewriting of the Urban Farm Code, but this report will skim some of the pertinent issues that came up during the rewriting process.

Boggy Creek, Rain Lily, HausBar, and Springdale are considered the “urban farms” while Urban Roots Farm is a “youth development organization that uses sustainable agriculture to transform the lives of young people and increase access to healthy foods”. (Urban Roots Farm 2013) The four urban farms stated their desires for what the City of Austin’s new Urban Farm Code should look like. The farm code rewrite was seized upon by the members of the Sustainable Food Policy Board (SFPB) as an opportunity to put in some very specific language with regards to the needs of farmers in an urban community.

In the end the urban farms got what they wanted, and likely needed, in order to stay in business. A few of the highlights from the rewrite are the creation of the market garden which allows small growers to sell vegetables directly from their property, third party sales are allowed but may not take up more than 20% of a farm stand’s sales and must be products from Texas, urban farms may have up to two dwellings on their property which is an increase from the previously allowed one dwelling, and urban farms located in single family residential areas can host up to six events per year but must apply for temporary use permits.

The Urban Farm requests and the results of the Urban Farm Code rewrite are both listed in Appendix B.

Land prices in Austin are high and many small scale farmers are not seeking wealth but work more of a labor of love, so they need to seek other means of income rather than relying solely on food sales (Banks 2011, 45) (Austin Urban Farms 2013).

The Urban Farm Code was out of date and a bit restrictive before the rewrite, and the SFPB addressed some of the “value added” needs that Austin’s urban farms have so that they could continue to be a part of Austin’s agricultural landscape (Toon 2013).

The HausBar closing was initiated by a neighbor filing a complaint about the odor coming from a black soldier fly composter. The farm was closed as a result of separate code compliance issue, the number of dwellings on site. This led to the realization that the City of Austin Farm Code was out of date and needed to be made more modern to deal with the increase in urban farming in the city and the diverse needs of those farms to remain in business (Toon 2013).

A larger, cultural issue appeared during the process of the Urban Farm Code rewrite. PODER (People Organized in Defense of Earth and Her Resources), an Austin based advocacy group, was a vocal opponent of HausBar farms, and the Urban Farm movement in general. PODER members issued such statements as “the farm movement is generally a white movement” and some members feel that the land that has been used for urban farming would be better used for affordable housing (Toon 2013) (McCarron 2013). The farmers, on the other hand, feel that they are benefitting the community, not harming it. That is the popular opinion held by most people that are in support of the local food movement (McCarron 2013). This raises an important point when promoting of urban agriculture and identifying suitable lands for food growth, especially in denser, more urban areas: not everybody wants the same thing (Toon 2013).

Economic Potential

There is great potential for the local food economy to contribute more to Austin’s overall food and entertainment economy. It is important to have other elements in place, like the Moontower Co-op food hub, to set up the network of growers, customers and

distribution to make it work. Any type of direct agricultural sale that occurs within Austin is going to be of greater benefit than a sale whose money leaves the city. Setting up the type of relationship similar to the example of the school districts in Oregon or getting support from the city to incent local agricultural purchases will have long term economic benefits for the community.

For the Austin MSA, an aggregate activity multiplier of 1.86 was found for the entire food sector, meaning that for every dollar of direct activity there was an additional 86 cents of economic activity (TXP, Inc. 2013, 21). This multiplier, along with the Portland school district example, is the type of activity that Moontower Co-op seeks to foster (Texas Young Farmers Coalition 2013). If Moontower could establish a relationship with the Austin Independent School District to provide even a small portion of the food they purchase, the benefit of the guaranteed sales to farmers and the multiplier effect in the local economy would have a great economic benefit to the city.

Even if the local food economy is evaluated on its own, separating it from the overall entertainment industry, it still holds value to the city economy even if it is small. Referring back to the direct sales number of \$0.82 compared to the national average of \$4.02 the room for growth is obvious, and the corresponding growth in related sectors would be beneficial as well.

RECOMMENDATIONS

Like any recommendation there are a lot of issues could that stand in the way of action or more issues that could arise if the recommended activity did occur. The relationships needed to establish a greater local food presence are complicated and would take coordination among many interested parties.

Recommendation #1 Create an inventory of all the potential urban agriculture infill sites

Even though it is evident there would be an ongoing public debate as to the best use of vacant/available sites, creating more urban agricultural landscapes should be a top priority. It is mentioned in the IACP as part of the Healthy Austin Initiative, and in addition to being in the building blocks it is part in the action matrix of the IACP.

The inventory would need to find as much vacant or unused land in neighborhoods that sit upon the Texas Blackland Prairie as possible. A lot of the best agricultural growth for education and access purposes is not going to occur on the peri-urban lands identified in this report. Because an AG use or Urban Farm can occur in so many zoning districts, the best location for small urban farms will be in existing neighborhoods. Having farms in established neighborhoods will create a greater connection to the community than any farm that sits on the edge of the city limits.

The Blackland Prairie location does not guarantee that the land is suitable for farming, nor does an Edwards Plateau location make the land worthless, but identifying the areas that tend to have fertile soils is a starting point and once they are identified a parcel by parcel analysis can be conducted. Depending on the type of farming/gardening to be done, any number of sites could be used.

Again, because urban farms will do more than just farm crops, this opens a host of other issues. Many urban farms will host events that increase traffic in the neighborhood and not everyone agrees on the best use for the land, but the process of identifying potential sites should be a low risk investment.

Recommendation #2 Start growing vegetables in the ETJ and prioritize agricultural land preservation

The sooner the AG land in the ETJ is used to grow food the better. Consider Michael Ableman's story, where his farm was slowly surround by the encroaching suburbs, and despite intense pressure to give up his farm and let the land be developed he stood his ground and once people realized the value it possessed to the community, it became an asset (Abelman 1998). Austin does not have issues like that because there are not vegetable producing farms in the path of suburban development. If food production could intentionally be put in the path of development, twenty years from now when the city expands to the outer reaches of the current ETJ, a farm could become a great asset for a community, rather than a burden or some stinky blight that needs to be removed.

This is, of course, easier said than done. One of the biggest challenges is finding the capital to invest in farming. Even if a young, experienced farmer did have access to the land, acquiring the loan necessary to start farming is not an easy process (Texas Young Farmers Coalition 2013).

Because food is readily available to the majority of residents in Austin, preserving agricultural lands that are not currently producing food does not seem like a high priority. The vision of growth put forward by the IACP shows proposed centers for growth and how those sit upon the prime farmland within Austin's city limits. It is the responsibility of planners to educate citizens on the need to preserve this land, not as a way to inhibit growth by creating an urban growth boundary, but by having the vision that the current global food system is not sustainable and that Austin needs to preserve prime farmland in order for future generations to have access to healthy foods.

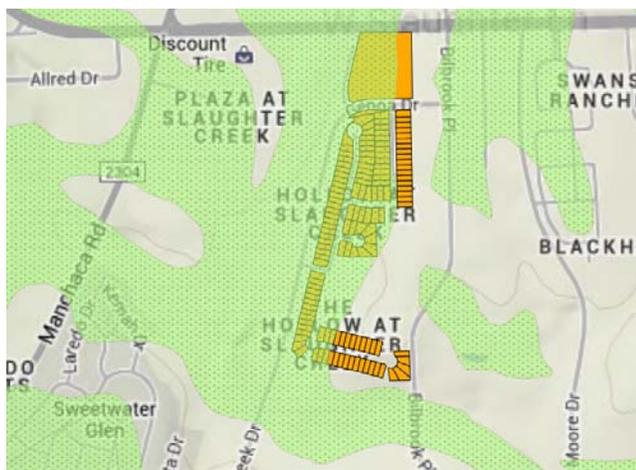
The strategy for identifying the lands to be preserved would need to be similar to that of the Agricultural Land Reserve of British Columbia: identify the current use, zoning, capability of the lands, and get public input.

Recommendation #3 Incent developers to leave some prime farmland undeveloped on their subdivision sites

If a developer was able to leave ten lots undeveloped at a tenth of an acre each, one acre of land could be open for farming. What would it take to convince a developer to do this?

Many new developments are going to occur in prime farmland. With the quality of the soils, good drainage, and flat surface, prime farmland unfortunately also makes good land to build on. Consider the development below in South Austin, where the green represents prime farmland. How much value is added to the homes if there is open space in the development? How much value is added if there is a farm located in the neighborhood? It is not an attractive proposal for everybody but if a few developers could get enough incentive then food production city wide would increase.

Figure 5.1: Subdivision on Prime Farmland



Source: City of Austin and USDA

A number of examples were cited in the literature review. Austin should look to these to inform decisions on what work best for the type of land being developed. It will be important for any developer to know that there is an interest in this type of development and that the houses will sell.

Taking stock of what is important to homeowners in subdivision that have golf courses could persuade developers to build this way. Often times it is not the golf course that attracts the home buyers, but the knowledge that the golf course is not going to be developed into more homes (Ladner 2011, 57). While not everybody plays golf, the developer could safely assume that everybody eats food.

Recommendation #4 Encourage growth with low-interest loans and a variety of types of urban agriculture

Capital is hard to come by for aspiring farmers. Austin could provide local growers with low-interest loans and other small business support to help with start-up costs and land acquisition (Urban Agriculture Task Force 2013). Once established, it will be apparent that different types of Urban Agriculture are going to produce different yields and appeal to different sets of consumers. Some farms will be focused on farming as a livelihood, while for others it is part of what they do but not necessarily their main source of income. SPIN farming produces food at a higher rate than Austin's current farms, so would greenhouses, or old warehouses that could be converted into aquaponic facilities, such as the example given about Will Allen's facility in Milwaukee.

Forbes predicted that by 2018, 20% of all produce will be grown in parking lot gardens or roof top gardens. With such a variety of potential urban agriculture options, but such difficulty in acquiring the money to start a food growing enterprise, the City of Austin should 'incent and develop' like it says will in Conservation and Environment Policy #13 from the Imagine Austin Comprehensive Plan.

CONCLUSION

Austin has no real geographic boundary to the east tell it to stop developing the land. To the west there are hills and the Edwards Plateau, which are not suitable to food growth. To the east, there are no mountains, no ocean or lake, just a lot of prime farmland. There are tens of thousands of acres of prime farmland on which millions of pounds of vegetables could be grown each year. This is also prime farmland on which developers can easily build.

Austin, as a city, does have the land necessary and enough systems in place to achieve the goals set forth by the City Council in its Imagine Austin Comprehensive Plan. Without specifics on which land is to be used for food growth, piecemeal development will eat up the prime farmland where peri-urban farms could thrive, making Austin continue to lean on surrounding counties for local food. While these local foods are still economically beneficial to the region, Austin would benefit more if that money not only did not leave the region but did not leave the city.

Urban Agricultural in neighborhood settings provide opportunities for education and access but also raises issues concerning best land use practices. Finding a balance between increasing urban agricultural production and keeping community members happy will be necessary as Austin continues to be one of the fastest growing cities in the nation and local food growth continues to be an important issue.

Health concerns are prevalent among lower-income residents and local food production can play a role in alleviating those health issues. It is a complex issue with more direct links between local food and health needed, but it does appear that more food production and access to those foods can play a role in both community and individual health.

More detailed analysis of the local food movement is needed. More potential growing sites and the missing parts of an efficient and profitable local food system need to be identified. Already considered a 'Green City', Austin should make food a focus and become a leader in the integration of urban agriculture into a growing urban environment.

Appendix A: Central Texas Vegetables

List of vegetables grown in Central Texas. These could replace “imports” from outside the region.

Table A1: Vegetables Grown in Central Texas

Arugula	Beets
Bok Choi	Broccoli
Broccoli Rabe	Brussels Sprouts
Cabbage	Carrots
Cauliflower	Celeriac
Chard	Chinese Cabbage
Collard Greens	Cucumbers
Eggplant	Endive
Garlic	Green Beans
Kale	Kohlrabi
Leeks	Lettuce
Melons	Mustard Greens
Okra	Onions
Peas	Peppers
Potatoes	Radish
Rutabaga	Spinach
Summer Squash	Sweet Potatoes
Tomatillos	Turnips
Winter Squash	

Appendix B: Austin Urban Farms' Urban Farm Codes Wish List

The following is taken from the Austin Urban Farms website and details some of the requests of the four Austin urban farms, Boggy Creek, Springdale, Rain Lily, and HausBar, with regards to the updates to the City of Austin's Urban Farm Code (Austin Urban Farms, 2013).

- Allow sales and delivery (retail and wholesale) of eggs, produce and protein grown on the urban farms and/or on other land owned and farmed by the urban farmer without restrictive percentages.
- Allow the raising, processing and sales of animal protein: eggs, rabbits, fowl and fish (through aquaponics).
- Allow sales of local third party, agricultural associated, products including coffee, produce, meat, dairy, eggs, bakery goods, etc., without restrictions on amounts of products sold.
- Allow Austin Urban Farms to host events including nonprofit fundraisers, weddings, supper clubs, garden clubs and school groups. This provides both a vital revenue stream and an important avenue for helping educate the community about our local farms.
- Allow more than one dwelling, as per current property zoning allows, for farm stays, bed and breakfast rentals and intern lodging.
- Allow classes such as composting, gardening, cooking/canning, harvesting/processing protein and animal husbandry.
- Allow independent craftspeople, artisans, artists and musicians on farm stand days at the discretion of the farm.
- Do not limit the number of employees Austin Urban Farms can hire.

- Do not place a maximum or minimum acreage for an urban farm

These are some of the results of the Urban Farm Code revision, with comments from Austin Urban Farms

- Market gardens, a new farm designation has been introduced to honor the small grower that in the past could grow vegetables on their property but couldn't sell them directly to people from their property. In the past they were non-compliant.
- Third party sales -Third party products should take up to no more than 20% of the farm stand's sales area and be produced in the state of Texas. Market Gardens cannot have a farm stand and can conduct sales out of sight of the general public on the property, and generate no more than three customer related trips per day an average.
- Dwellings: Urban farms can have up to 2 dwellings on the property, which is an increase. Auxiliary structures should be allowed
- Employees: Two employees per acre of partial acre
- Staff added: Additional use for Indoor Crop Production for CS zoning and above, for the purpose of raising and harvesting indoor tree, row or field crops on an agricultural or commercial basis, including packaging & processing.
- Animal Raising and Processing: Raising fowl, rabbits and fish (aquaponics only) allowed. No processing or composting in single family use but can be allowed in commercial uses and other zoning categories. Animal harvesting has not been eliminated completely from City limits.
- Events – Urban farms in Single Family zones will have to apply for a Temporary Use Permits in order to be an outdoor entertainment and they are only allowed six a year.

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