Opportunities for Incorporating Food Landscapes in Public Parks

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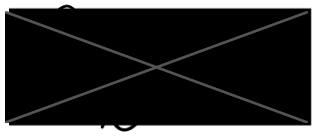

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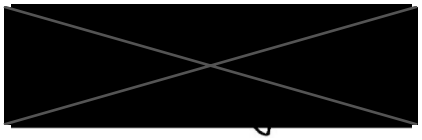

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Abstract

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Public parks are an integral part of many urban areas within the United States, and provide a number of ecosystem and community benefits. However, localized food production, including food landscaping, is not often incorporated into these spaces. Including food landscaping in public parks has the potential to increase benefits and create local food supply chains. The purpose of this study was to explore cities' views on food landscaping projects, including the barriers that exist for implementing these projects, and to create an implementation guide that can be used by city governments to convert existing public greenspaces into multipurpose food landscapes. This study used the City of Poway in Southern California as a case study to look at why cities do not pursue these projects, and to explore the information that cities could find helpful when developing these projects. The researcher conducted eight interviews with various city employees using semi-structured interviews. Findings suggest that food landscaping in public parks is possible but will require cities to rethink what public parks are designed for and innovative ways to overcome various barriers that may exist for these projects. Participants discussed a variety of benefits that these projects can bring to both a community and a city, which may provide greater impetus for incorporating these projects in the future. This study and accompanying implementation guide pave the way for future research on food landscaping in public parks.

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Chapter 1: Introduction

Urban areas continue to grow and currently encompass more than 50% of the world's population, with growth expected to continue until 68% of the global population lives in urban areas by 2050 (United Nations, 2018). As urban areas continue to increase, these areas come into contact with agricultural land use, leading to the development and urbanization of prime farmland, and causing agricultural livelihoods and cultures to disappear (American Farmland Trust, n.d.). This has led to tensions between land uses, ways of life, and employment opportunities. In California, for example, high land prices and a severe housing shortage have led to the conversion of forty-thousand acres of prime farmland a year on average (California Department of Food and Agriculture, 2009).

As urban areas continue to grow, local food production in the form of urban agriculture is being considered as an important way to incorporate food production into urban settings. This has led to a growing body of literature that focuses on ways to integrate food growing systems into the urban environment, thus creating space for a land use that has historically been relegated to the outskirts of a city. Initiatives for urban agriculture can include community gardens, green roofs, and food forests, and these projects are often created to fulfill a variety of purposes, including decreasing food insecurity levels and the greenhouse gasses associated with traditional agriculture. However, these projects are often developed by the non-governmental or private sector, rather than city governments, which results in urban agricultural projects occurring on only certain types of land, including abandoned lots and private property, while public lands, including urban parks, are often overlooked.

Moving forward, it will be important to consider the role that public land can play in the growing interest for urban agriculture, with attention focused specifically on urban park space. Public parks have served a variety of purposes since the first pastoral parks were developed at the outskirts of urban areas in the mid-1800s (Cranz and Boland, 2004). Urban parks currently incorporate passive and active uses such as nature appreciation and recreation, in addition to providing an open space for communities. In addition to community benefits, park spaces also provide ecosystem benefits, such as filtering air and water, and in some instances can reduce the urban heat island effect, which will become more important as urban temperatures rise with climate change and an increase in the built environment.

Historically, park uses have shifted with societal needs. These park structures have lasted anywhere from 30 to 50 years before expectations cause a shift in purpose (Cranz, 2008), leading to the development of new park spaces with different functions. This timeline suggests that society may soon reconsider the purpose and function of public parks, which is projected to lead to the incorporation of an environmental and sustainability focus, to which food landscaping could contribute. And while this shift may lead to an increase in co-benefits, it is important to note that public parks are not available to many people within the United States for a variety of reasons, including physical proximity and safety concerns, which is a barrier that must be addressed moving forward (Centers for Disease Control and Prevention, 2022).

While there is a growing body of literature around urban agriculture and the ways it can be incorporated into cities, this growth in research has not extended to the incorporation of food landscaping in public parks, nor are there many examples of these projects in the United States. As such, the purpose of this study was to explore cities' views on these projects, and to create an implementation guide that can be used by city governments to convert existing public greenspaces into multipurpose food landscapes. This study used the City of Poway in Southern California as a case study to look at why or why not cities pursue these projects, and the

information that cities could find helpful when developing these projects. The research was guided by two key questions:

1. What are the benefits and barriers to incorporating food landscaping into existing public greenspaces?
2. What are the mechanisms and pathways for implementing these projects?

This study will begin by looking at the literature around the loss and reintegration of agriculture into cities and the role of public parks, before discussing the methods and results for this study, and introducing the implementation guide that was written for this paper. As the literature suggests, there is currently a gap in understanding how public greenspaces can be used for food landscaping and the benefits that would result from these projects. As such, there are a number of groups that would benefit from this study, including city governments - both city employees and city council members - community members, and nonprofit and other organizations that are interested in partnering on these projects. This study is especially applicable to those who are interested in incorporating local food production, considering climate change initiatives, or who are interested in greater community engagement and cohesion. In addition, the implementation guide that was developed in conjunction with this research will assist cities in developing these projects by providing them with the necessary steps to creating these spaces.

Chapter 2: Literature Review

As cities move towards a more sustainable model that includes reducing carbon footprints and adapting to a new reality of living with climate change, it is important to understand the barriers and opportunities to incorporating food landscaping on city-owned public lands. These benefits and challenges that cities face are based on different elements related to the historic separation of cities and agricultural production, the subsequent push to reintegrate agriculture into urban areas in diverse ways, and the potential for city-owned public land to be utilized for new purposes like food growing. For the purpose of this study, two main bodies of literature are considered: 1) loss and reintegration of agriculture into cities; 2) and the purpose of public parks for urban agriculture. Looking in-depth at the research surrounding these topics will allow for gaps in the literature to be identified.

Loss and Reintegration of Agriculture into Cities

Historically, cities in the United States were founded next to prime farmland, in order to sustain an urban population with locally grown produce as the country grew (Langemeyer, 2021; Seto, 2016). As a result, urban growth often comes into conflict with agricultural land use, causing a decrease in agricultural land located near cities as urban and metro areas as a result of development, and a change in the culture and livelihoods in these areas. Moving forward, an increase in urbanization and population growth will continue to bring metro areas and agriculture land uses into conflict. However, the expansion of urban areas has also led to a subsequent increase and reintroduction of agriculture into urban settings, known as urban agriculture, which is changing the way people view food production.

Urban Growth and Farmland Loss

Urbanization is growing as a result of a cultural shift in living expectations and the continued population growth in cities. By 2050, roughly 70% of the global population is projected to live in urban areas, which has contributed to the push for increased urban development (United Nations, 2018). Dense urban areas are on average less energy intensive and require fewer car miles than urban sprawl or rural development (Tomer, 2021). However, urbanization in the United States, combined with people's desires for single-family homes and automobiles, has led to sprawling development and suburban neighborhoods (Tomer, 2021). Urban sprawl is a type of uncontrolled development often characterized by compact urban cores located at the center of development, surrounded by single-family dwellings that require automotive dependency, edged by a peri-urban area that blurs the division between urban and rural land (Brody, 2013). These suburban, single-family homes use more energy for heating and cooling, and the resources needed to develop this infrastructure contribute to greenhouse gas emissions (Tomer, 2021). These development methods have led to urbanized areas growing at almost twice the rate of the population they house (d'Amour, 2016; Tomer, 2021; The World Bank, 2020).

This expansion not only contributes to climate change through the reliance on automobiles and an increase in infrastructure development, but also brings urban development and its inhabitants into conflict with rural areas, including both open space and agricultural land use. Historically, during the United States' early development, most cities were built around prime farmland that allowed for localized food production (Langemeyer, 2021); globally, more

than 60% of irrigated cropland is located next to urban areas (d'Amour, 2016). As a result, land use change and increased urbanization can threaten current agricultural practices located around urban areas (d'Amour, 2016; Seto, 2016; The World Bank, 2020), specifically impacting prime farmland and decreasing these spaces and their food production. As the need for urbanization continues to increase to provide people with the housing and communities that they desire, the loss of farmland will continue as well.

Rates of farmland loss vary globally. While countries such as China are seeing major and rapid urban expansion that impacts vast areas of farmland, U.S. urban expansion remains relatively dense, leaving large swaths of farmland untouched (d'Amour, 2016). However, according to the 2017 Census of Agriculture, 34 states in the U.S. have experienced farmland loss, with California, Texas, Wyoming, New Mexico, and Montana losing the most acres (American Farmland Trust, 2019). In California, which produces over a third of the country's vegetables and two-thirds of the country's fruit and nuts (California Department of Food and Agriculture, 2020), forty-thousand acres of farmland are lost every year to urban expansion (California Department of Food and Agriculture, 2009), which has led to the creation of government and non-profit projects designed to conserve farmland and livelihoods (Sallet, 2020). With the state experiencing a severe housing shortage and expensive land prices, farmland will continue to be developed in the push to house more people (Woods, 2019), a pattern which is unlikely to change even with farmland conservation measures (Lambin, 2011). Calls to conserve farmland and promote eco-friendly farming methods to support ongoing climate change initiatives contribute one solution to this conflict, while an alternative solution is to continue separating urban and agricultural land uses.

The increased growth of urban areas and the subsequent loss of farmland has also altered the relationship that people in urban areas have with the food they eat, resulting in a decreased understanding of food production (Lovell, 2010). In addition, dense urban areas often lead to a rejection of smaller localized food supply chains that rely on small growers in favor of higher food diversity and more affordable prices at supermarket chains (d'Amour, 2016, Seto, 2016). These stores favor global food supply chains and imported products, perpetuating the increased separation of food production and consumption (Lambin, 2011). However, it remains to be seen how global food supply chains will respond to decreased food production due to climate change (Porter, n.d.; United Nations Environmental Protection Agency, n.d.), in addition to continuing global conflicts like the war in Ukraine or future pandemics that result in a shock to supply chains (Felix, 2020; Murphy, 2022; United Nations, 2022).

Urban Agriculture and Integration of Food Production

As urban areas continue to expand, one alternative to farmland loss – and a reversal of decades of land use separation – has been the expansion of urban agriculture projects (Lambin, 2011). The development and implementation of urban agriculture (UA) in the United States is a relatively new concept. While UA is used throughout many parts of the developing world in order to stave off food insecurities and generate income (Golden, 2013; Rogus, 2015; Wortman, 2013), within the United States urban food production has traditionally served a different purpose (Rogus, 2015; Wortman, 2013). During times of economic hardship, for example during World War II, small-scale community and victory gardens were used to support communities and reduce outside need (Wortman, 2013). At the height of their production, these gardens produced 40% of all vegetables consumed in the United States (Steinhauer, 2020), although these projects fell out of favor once the need faded (Wortman, 2013).

OPPORTUNITIES FOR INCORPORATING FOOD LANDSCAPES

Presently, the idea of developing more UA projects is growing in popularity; however, unlike developing nations and the victory gardens of old, these small- to mid-sized urban farms are being considered not only for their food production, but for other co-benefits as well, such as ecosystem and community benefits. As a result, UA can be difficult to define due to the fact that it can serve many different purposes, including supporting various social and equity issues within the United States (Rogus, 2015). According to the U.S. Department of Agriculture (n.d. Urban Agriculture), there is currently no single definition of urban agriculture, although the USDA website defines UA as:

> . . .city and suburban agriculture that takes the form of backyard, roof-top and balcony gardening, community gardening in vacant lots and parks, roadside urban fringe agriculture and livestock grazing in open space.

This definition suggests that UA is a broad topic that can be viewed in many different ways and can lead to a variety of project types. In particular, UA is often considered as a strategy to achieve social and environment goals (American Planning Association, n.d.) and is often spearheaded by nonprofit ventures. These nonprofit programs have successfully provided healthy choices and supported economic development, including increased land value, community revitalization, and job creation (Vitiello and Wolf-Powers, 2014). As a result, local governments are beginning to take an interest in these initiatives (American Planning Association, n.d.). This suggests that the growing government interest in UA is born in part out of community-based movements, with greater community awareness providing the potential for more cities to become involved in UA projects.

UA can serve many other purposes within an urban area besides economic incentives, including greater cultural exchange, beautifying or greening a community, and providing fresh produce to food insecure residents (London, 2020; Rogus, 2015; Wortman, 2013). These multipurpose UA projects, which focus on both food production and social benefits, can provide greater cultural exchange, educational and skills building potential, and increased community engagement (Newell, 2022). In addition, many nonprofit organizations and city governments that are starting these projects recognize that climate change will continue to impact crop growth and food access (Halvey, 2021), and that producing food locally will create climate-resilient communities that rely less on fragile global food supply chains (Clendenning, 2015; Alkon, 2012).

Climate Change and Urban Agriculture

Urban agriculture initiatives are often considered in conjunction with climate change, either as mitigation for future climate change impacts that will affect traditional agriculture, or as a way to increase climate-resilient communities (de Zeeuw, 2011). In relation to traditional agriculture, as climate change leads to rising temperatures, increased drought, and more frequent storm events, traditional large-scale agriculture will be impacted and crop production will decrease over time (Arora, 2019). As a result of both the decrease in prime agricultural land from urbanization and the expectation that crop production will be reduced due to climate change, there are calls to consider UA as a potential adaptation strategy (Langemeyer, 2021).

Currently, agriculture accounts for roughly 11% of the United States' GHG emissions, meaning a reduction in emissions could significantly decrease the country's climate contributing emissions (United States Environmental Protection Agency, 2020). Almost 11% of these

agricultural emissions result from food transportation, which UA and local food production can provide a solution for (Weber, 2008). UA, which prioritizes the consumption of locally produced food, can lead to a reduction in food miles or vehicle miles traveled (VMT), which are the transportation miles associated with food production (Newell, 2022; Weber, 2008; Zumkehr, 2015). VMT can include intensive freight and air transport that brings food from rural agricultural zones to urban centers (Weber, 2008; Zumkehr, 2015). Aside from transportation emissions, the majority of agricultural emissions are attributed to the production side, in the form of methane and nitrous oxide emissions (Weber, 2008). One main benefit for UA projects is education, including encouraging a dietary shift by teaching people to eat more fruits and vegetables by providing access to fresh food and resources (Newell, 2022). This shift could greatly impact production emissions associated with livestock by reducing meat consumption, and provide the greatest change in emissions associated with agriculture (Weber, 2008; Zumkehr, 2015).

In addition to impacts on traditional agriculture, UA is also considered in conjunction with adaptation and mitigation strategies for urban areas to respond to climate change. Cities currently produce roughly 70% of global greenhouse gas emissions, making urban areas one of the main contributors to climate change while also remaining vulnerable to the effects of climate change (Dasgupta, 2022). As a result, urban areas are apt locations for implementing climate mitigation strategies that can lead to more sustainable living conditions, with many cities considering UA as one possible initiative (de Zeeuw, 2011). UA has the potential to mitigate climate change through environmental improvements, including reducing polluted stormwater runoff and cleaning local air quality (de Zeeuw 2011; Langemeyer, 2021). As a similar adaptation strategy, UA prioritizes greening spaces and incorporating urban forestry techniques, which can capture more rain and stormwater runoff and prevent future floods. In addition, UA can assist in expanding tree cover and reducing the urban heat island effect (Mancebo, 2018), which could potentially decrease deaths associated with increased urban temperatures.

As a climate adaptation strategy, UA improves education and community understanding around food production and ecological knowledge (Langemeyer, 2021; Newell, 2022). This can strengthen the understanding of human climate impacts, while also creating more climate-resilient communities that focus on innovative solutions to climate change. In addition, UA provides an alternative or addition to the global food supply chain, which many countries currently rely on for their food supply (d'Amour, 2016; Langemeyer, 2021; Newell, 2022). As traditional agricultural production decreases from climate change, potentially leading to global food shortages, UA can diversify food supplies and production networks, providing food for communities even if these global networks falter (de Zeeuw, 2011). This increases resiliency in the face of major changes (Langemeyer, 2021), and can both help urban areas respond to shocks in the global food supply chain and also adapt to decreased agricultural production.

Barriers to Urban Agriculture and Relationship to Public Lands

While UA initiatives are increasing due to the number of benefits associated with these projects, there are a number of barriers that can impede these projects and decrease the likelihood of their implementation. The lack of clarity on what is or is not an urban agriculture program is something that can impact government funding and policy expectations. This often leaves UA under the purview of nonprofit organizations and the private sector rather than governments. This can reduce the ways in which UA can be incorporated into cities, including on city-owned public green spaces. Cities that do initiate UA programs often do so on an individual level based

on community and government interest, which can lead to a disjointed approach between cities with differing expectations, program structures, and funding and management designs (Rogus, 2015). There are currently few city-centered frameworks that call for complete integration of urban agriculture into planning, zoning, and project initiatives, which is a gap that nonprofits serve to fill (Halvey, 2021). In addition, most cities do not have a central food agency, meaning policies are developed across multiple departments and agencies that must communicate with one another, and which community members interested in UA projects must navigate (Halvey, 2021). This can lead to confusion over rules and regulations, and the types of projects that are allowed.

In addition to the disjointed approach to UA, the issue of land costs has also acted as a barrier to UA. As urban areas continue to grow in density, access to affordable land for any purpose is scarce, either forcing UA projects to the fringe of urban sprawl development (e.g., peri-urban areas), or limiting community access to a variety of UA projects (Rogus, 2015). While peri-urban areas have traditionally seen more agricultural projects because of a lack of density and more open space, as urbanization continues to increase, these traditionally sprawling areas will continue to see open space and agricultural lands developed and agricultural projects diminish (Langemeyer, 2021).

High-priced land that can be used for multiple purposes is often a regional issue that can contribute to the varied approach to UA. Land prices may be high in urban areas of California, whereas many cities in the Midwest are known as “legacy cities” (areas that experienced a boom in economic value and then a bust), which tend to have a higher number of vacant lots and cheaper land that cannot be profitably developed (Newell, 2022). These cities may have greater potential for large scale UA projects in the urban core and fewer barriers to starting projects, as opposed to the urban cores of expensive areas with high land prices and fewer empty lots, or larger peri-urban areas in areas with high land costs (Rogus, 2015). While areas in the Midwest may have access to more affordable land, most city policies are still not developed with food production in mind, including access to the municipal water supply, composting, and animal husbandry laws (Golden, 2013; Halvey, 2021; Rogus, 2015). In addition, these empty lots located in urban areas have led to many UA designs that rely on leasing programs and community gardens. These programs can either be developed and endorsed by local governments, or take place on privately owned land. These programs, especially in legacy cities, are often designed as temporary, with the expectation that once the land becomes more valuable for development, the agricultural use will end in favor of development (Newell, 2022). Rather than generating interest in agricultural programs, this instead creates uncertainty over land tenure and the stability of these programs, which decreases the likelihood that community members will get involved (Guitart, 2012; Lovell, 2010; Newell, 2022).

This barrier can be partially rectified through changes in city planning and expectations, and by including urban agriculture initiatives into planning strategies as goals to be met and kept by cities – thereby recognizing the value of these programs besides profit (Lovell, 2010). In addition, another potential solution to this barrier is the utilization of city-owned public greenspace to produce food, since this land is protected through city zoning and designed to act as a community greenspace (Lovell, 2010). Public parks are sometimes used for community garden programs, which are an important UA addition but have their own barriers. Community gardens are generally plots of land that are often rented or leased by members of the community and are used for personal food production and consumption (U.S. Department of Agriculture, n.d.). Because these plots are often rented for an annual fee and designed for individual use, these spaces are not open to every community member, and if established on public parks, can

actually limit the use of a public and community-oriented space, sometimes leading to rejection by other members of the community who use public spaces for other purposes (Lovell, 2010).

One potential remedy for this issue is to convert existing park spaces into food landscapes, thereby decreasing costs and increasing community benefits, and potentially even profits (Hosseinpour, 2022). These converted green spaces, unlike traditional park spaces, would serve multiple purposes and would increase the various benefits that park spaces provide (Clark, 2013). Benefits of these multipurpose green spaces would resemble those of other UA projects, including continued access to green space, community cohesion, and educational value, in addition to environmental benefits such as air and water purification. These food landscapes could also serve to rewrite the purpose of UA, thus providing more opportunities for cities to integrate UA into their park spaces if there were co-benefits in addition to food production. When surveyed, community residents often cite benefits outside of food production as more important, such as the cultural services that these projects can provide (Guitart, 2012; Newell, 2022). These can include meaningful community interactions and increased community cohesion, greater food literacy, and beautification. Since a barrier to UA is often a lack of government support (Newell, 2022), these additional benefits outside of food production and environmental benefits can provide cities with an incentive to initiate and fund programs that a community meaningfully benefits from. In addition, this approach has the potential to decrease the conflict between UA and high land costs in dense urban areas, instead shifting UA programming to integrated greenspaces rather than dedicating valuable land for food production (Lovell, 2010).

Public Parks in the United States

As urban spaces continue to grow, reducing prime agricultural land and leading some cities and advocates to call for an increase in urban agriculture initiatives, the actual incorporation of UA, including potential UA venues, must be considered. While many UA projects face barriers such as high land prices and land use competition, the use of public parks as a space for food landscaping has been a relatively overlooked option. To better understand the ways in which open space and green spaces are incorporated into cities, and how that may relate to urban agriculture initiatives, it is important to look at the history and incorporation of public parks in the United States, in addition to current and future uses.

History of Public Parks in the United States

Public parks have been a mainstay of the urban and peri-urban landscape in the United States for decades, and have served many varied purposes in that timeframe. Initially, public parks were designed starting in 1850 as pastoral landscapes that brought rural ideas to the city edge (Cranz and Boland, 2004; Cranz, 2008). These parks are generally associated with figures like Frederick Law Olmstead and Calvert Vaux, who created Central Park in New York City (Central Park Conservancy, n.d.). These spaces provided both active and passive recreational uses, including areas for sports (active) and spaces for contemplation and appreciation (passive), and were initially utilized mainly by the wealthy class due to their separation from the urban core and the working-class neighborhoods. In 1900, as the *pleasure ground* park gained popularity, these spaces were incorporated into the dense city areas to appeal to the masses (Cranz, 2008). These *reform parks* were devoted less to pastoral reflection and more to educational and recreation opportunities, and were created closer to homes and generally included playgrounds

for children (Walls, 2009). The importance of recreation quickly grew in the 1930s and onwards, leading to the *recreation facility* park system, which was associated with things like sports fields or public pools. These spaces focused primarily on active uses and recreational purposes rather than on open greenspaces, in part to justify funding (Cranz and Boland, 2004). The final development of the urban park system took place in 1965 with the creation of the *open space* park, as a response to the perceived sterility of recreational facilities (Cranz, 2004). These new public parks incorporated elements of both recreation and open space, and including more culturally relevant activities like artistic performances and social activities (Ellis and Schwartz, 2016).

Purpose and Benefits of Public Parks

As the framework for urban parks developed from the *pleasure ground* of the 1850s to the current *open space* system, each new park structure responded to the societal needs of the time. For example, while the *pleasure ground* was designed for the passive and active recreation of the wealthy, the *reform park*, which emerged in 1900, responded to the middle- and lower-class need for open spaces that children could utilize. This suggests that these public spaces are designed around community needs and expectations and respond to shifts in community requirements (Cranz and Boland, 2004).

When considering these open spaces, it is important to take their purposes and benefits into account, which can directly impact the management of these spaces, and assist municipalities in maintaining these spaces (Larson, 2016). While park spaces generally follow the same structure, these spaces do not follow a comprehensive management system, instead varying by municipality, purpose, and perceived benefits (Ellis and Schwartz, 2016). As a result, cities' management strategies for these spaces can differ, and departmental oversight can vary between cities. This is in part because urban parks can provide a variety of services that vary between sites.

At the most basic level, parks provide a variety of important ecosystem benefits for both the environment and the community (Mexia, 2018). This can include an improvement in air and water quality, as greenspaces filter stormwater runoff, clean the air, and in some cases increase oxygen levels (Larson, 2016). These ecosystem benefits can be an important climate mitigation and adaptation strategy moving forward. An increase in greenspaces and a change in how these spaces are designed can positively contribute to a decrease in the threat of floods while mitigating storm runoff (Parks California, n.d.). By including greenspaces in urban areas, which have impervious surfaces, the threat of flooding and stormwater pollution can decrease. In addition, publicly maintained greenspaces often include increased tree canopy and vegetation, which can decrease the urban heat island effect (Lin, 2017). As a result, more unique and innovative greenspace varieties are being included in general plans and climate action plans as a way of mitigating the urban heat island effect, which will only intensify with climate change (Corburn, 2008).

In addition to ecosystem services, urban parks create space for passive and active recreation (Ellis and Schwartz, 2016). Many urban park spaces are community oriented (Shuib, 2014), and can revolve around or include sports fields, playgrounds, and bodies of water, all of which are designed for active enjoyment. Urban parks also act as a community meeting space, which can strengthen the ties between residents and lead to increased community cohesion and cultural exchange. These myriad purposes are intrinsically linked to their benefits. As a result of their recreational offerings, the Centers for Disease Control and Prevention (2022) considers the

inclusion of public greenspaces as necessary for creating healthy communities. Both the ecosystem and recreational services that urban parks offer in turn provide mental and physical benefits (Chiesura, 2004; Larson, 2016). Communities that have access to green spaces are on average healthier, experience fewer cardio issues, and can even exhibit fewer depressive tendencies (Chiesura, 2004). Often, these benefits assist municipalities in planning for the future and understanding how these spaces fit into the fabric of a community; however, because many of these benefits are intangible, it can be difficult to put a monetary value on urban parks, which can cause governments to overlook the importance of these spaces (Ellis and Schwartz, 2016). As a result, there is a growing body of literature that is attempting to measure these benefits, including the impact on the surrounding environment and the ways in which community members respond to and utilize these spaces. Moving forward, these studies will assist cities in advocating for these spaces and developing new ways of using them.

Sustainable Public Parks of the Future

When discussing the four previous park types, many scholars note that park structures generally last anywhere from 30 to 50 years, generally aligning with a shift in public expectations of city greenspaces. As societal expectations shift, new parks reflect these changing expectations and incorporate new purposes. The *open space* system was developed in 1965, which suggests that changing societal expectations will lead to a new type of urban park. Currently, urban parks are integrated into city plans as providers of services, spaces that people can interact with, rather than as a source of goods (McLain, 2012). These spaces do not provide community members with products, which are often reflected in city regulations that bar or fine people from removing materials from public parks. While this can protect conservation areas from disruption, these policies can also keep people from foraging or gleaning in a public space (Minneapolis Parks and Recreation Board, 2017). While there have been examples of guerrilla planting in public parks, where people plant fruit trees without city permission, legally people often cannot pick from these spaces (McLain, 2013). This restriction has started to abate in some cities that are incorporating food landscaping into their public parks. Previously, Minneapolis' law against "vegetation molestation" reflected the idea of parks as providers of services rather than goods by barring people from removing materials. The law has since been updated to allow people to take from specifically marked trees and plants (Minneapolis Parks and Recreation Board, 2017). This suggests that some communities desire a different public park structure, while still reflecting the limitations of the *open space* model.

This expected shift in the public park structure has the potential to change how people interact with these spaces, in addition to changing how these spaces are designed and integrated into urban spaces. While the benefits that parks currently provide revolve around how people interact with these spaces recreationally, there is the belief that these open spaces will shift to focus more on sustainability and community building, in part based on the growing awareness of climate change (Parks California). It is critical to understand the shifting expectations for these spaces in order to plan for their future. This can include considering new uses for and increased interaction with parks. It is especially important to consider this shift in relation to local food production and urban agriculture. In a 2013 report of urban parks conducted for the International Federation of Parks and Recreation Administration (Konijnendijk), the authors surveyed the literature on the benefits of public parks, which emphasized the importance of the many ecosystem and recreational benefits that these spaces provide. However, other potential benefits, such as food production – a logical use of open space – were considered less important in a park

context.

As sustainability becomes a larger conversation, the typical approach to parks may shift, leading cities to view urban parks through a sustainability lens, and to see them not only as a provider of services but also as a source of goods (McLain, 2012). This can include greater educational potential for these spaces, especially when it comes to educating the community on the natural world and the environment. This new park structure also has the potential to shift the output or productivity of public parks, and to alter the ways in which city planners consider incorporating these spaces into cities. This fifth park system, sometimes called the *sustainable park*, would focus more on sustainability and co-benefits, and has already been implemented in other countries like China, where they produce goods in their parks (Cranz, 2008) and also incorporate green spaces in more innovative ways (Lange, 2022). In addition to focusing on land restoration through native plants and streams, composting, and reusing local materials (Cranz, 2008), this new model focuses on the integration of urban forestry techniques. In a 2013 study, Clark and Nicholas present a future vision of urban food forestry, in which public land – including public parks – is used to produce food for local populations. Their structure blends urban agriculture techniques and forestry initiatives onto public lands in an effort to decrease food insecurities and produce more resilient communities. In addition to urban food forestry, these green infrastructure projects can also focus on bioswales for flood prevention, rooftop gardens that reduce heat, and public orchards (McLain, 2012). Moving forward, as more communities focus on climate resiliency and sustainability initiatives, this vision of sustainable parks may pave the way for a new model of parks in the United States (Lange, 2022). As these societal desires grow, public parks are a logical place to incorporate new ideals, leading to calls for more food landscaping on public lands (Matchar, 2020). Since 2018, over two million acres of land in the US' 100 largest cities have been devoted to urban park space (McCabe, 2018), which provides plenty of opportunities for localized food production and food landscaping. The lack of current projects suggests that this potential use of space is not being considered by local governments.

Chapter 3: Methods Section

The purpose of this study was to explore cities' views on food landscaping projects, and to create an implementation guide that can be used by city governments to convert existing public greenspaces into multipurpose food landscapes. This study used the City of Poway in Southern California as a case study to look at why or why not cities pursue these projects, and the information that cities could find helpful when developing these projects. The research was guided by two questions:

1. What are the benefits and barriers to incorporating food landscaping into existing public greenspaces?
2. What are the mechanisms and pathways for implementing these projects?

Interviews were conducted with eight city officials in order to gain insight on how cities consider food landscaping projects, and to inform the content of the implementation guide. The interviews were conducted over Zoom and phone calls. The interviews were semi-structured, and two groups of city employees were interviewed: those who worked on similar food landscaping programs, and employees for the City of Poway. Four cities with existing food landscaping projects were interviewed:

1. Asheville, North Carolina's *Asheville Edibles* program incorporates food landscaping in public parks
2. Durand, Michigan's *Beautification Project* includes edible and ornamental plantings on city land
3. Long Beach, California's *Willow Springs Park* has an edible demonstration garden and public orchards
4. Oakland, California's *Gardens at Lake Merritt* has an urban edible garden

Interviews were designed to look at the benefits, barriers, and mechanisms to project implementation.

Case Study and Sampling

This study focused on two groups of cities to interview. The first group were cities that had implemented some form of food landscaping or similar urban agriculture project on city-owned public land that remained managed by city officials. Four cities were interviewed for this section. These cities were found through online searches, and emails were sent to the city employees in charge of the projects, explaining this study and its goals. Interviews were conducted via zoom.

The City of Poway, located in Southern California, was chosen as the focus for the second set of interviews. Poway has 25 public parks, and is located in a suburban area of San Diego County that is undergoing urbanization. In addition, Poway does not have a climate action plan, and the city's general plan was last comprehensively updated in the '90s and makes no mention of urban agriculture. As such, the city was used as a case study to discover major barriers to these projects and to inform the implementation guide's contents on ways to assist cities in implementing food landscaping projects on public land. Emails were sent to various city officials who worked in the city planning, development services, community services, and public works departments, as Poway does not have a sustainability department or employee. Interviews

were conducted with four pertinent individuals from Poway either through zoom or phone calls.

At the beginning of all eight interviews, participants were asked for verbal confirmation to allow their conversations to be recorded for transcription and reference purposes, and were told that their names would not be used in reference to the information gathered. Once verbal consent was obtained, the interview proceeded.

Data Collection

Data were collected through semi-structured interviews (Appendices A & B). Because there were two groups of individuals interviewed, there were two interview guides designed. The first interview guide, which focused on cities that had already implemented similar UA programs and initiatives, consisted of seven questions. During the first part of the interview, questions were designed to gain general information about the project, including how it started, how the community interacts with this project, and other types of UA the city might be considering. The interview then shifted to focus more on specific aspects of the project, including funding sources, the benefits and barriers that the city experienced, and information that would have assisted the city in implementing this and similar projects in a more efficient manner. On average, interviews with these four cities lasted for 30 minutes.

The second interview guide for Poway employees consisted of six questions, and was designed around the knowledge that the city has not implemented food landscaping projects on public lands, and has no published plans for future UA projects. This interview focused on gathering information about any future plans the city might have for UA programs, the specific barriers that the city faces when considering these programs, and the types of information that would aid Poway and cities like Poway in implementing food landscaping on public lands in the future. On average, interviews with Poway city officials lasted for 30 minutes.

Data Analysis

Interviews were audio recorded and transcribed to assist with the coding process. Both sets of interviews were analyzed and coded into three emergent groups, which are discussed in the results section. Analysis focused on qualitative data gathered through the interviews, and was coded according to the two research questions designed for this research paper.

Limitations

While the researcher was able to interview four cities that have implemented similar urban agriculture projects on city land, this was not an exhaustive sampling. Many cities have either not updated their websites with project information or have chosen not to advertise food landscaping programs, meaning many city projects of a similar nature may have been overlooked. For example, cities may not post that there are fruiting trees in public parks - which would fall within the scope of this program - because they may not have been planted by the city and therefore are not managed by city employees. However, some cities in this situation may be working to incorporate these trees into their plans moving forward. As a result, cities that have similar projects may have been overlooked, and information on their project implementation that may have informed this study was not gathered.

In addition, because this project's case study is located in California, some of the barriers that this city is experiencing may be specific to the state and not applicable to other cities that are considering these projects. Moving forward, it would be best to conduct a more comprehensive study that focuses on various cities throughout the United States, to understand the reasons why more cities are not considering food landscaping on public lands.

Chapter 4: Results Section

Interview results provide answers to the following two research questions: (1) What are the benefits and barriers to incorporating food landscaping into existing public greenspaces; (2) and what are the mechanisms and pathways for implementing these projects? Responses to the semi-structured interviews with eight city officials were analyzed for patterns and organized based on response and research questions.

What are the benefits and barriers to incorporating food landscaping into existing public greenspaces?

Benefits of Food Landscaping

Interviewees were asked to describe what the benefits are for food landscaping projects. For the four individuals who were already working on projects similar to what this study focuses on, they were asked to discuss the benefits that they have seen from their projects. The four Poway employees interviewed were asked what they believed the benefits from these types of projects could be. Responses were organized into three categories: Social; Environment; and Health (Table 1).

Social: Six cities described social benefits as being an important aspect of food landscaping, and responses were broken up into three categories: education, community engagement, and economic development. Five out of eight respondents mentioned educational benefits, including three participants who were already working on food landscaping projects. One participant from Poway explained:

> There's an education component to it, because families, you know, they grow up around urban agriculture and they can start to understand how plants grow, where the food comes from, and kind of the need to have and preserve those types of land uses everywhere in the world.

Another Poway employee mentioned that educational benefits could also extend to business skills for the community, while other examples of these benefits included the creation of garden workshops in Long Beach and the explanation of historic agricultural land uses in Asheville.

In addition to educational benefits, the second social benefit that respondents mentioned was community benefit and engagement. Half of interviewees - one individual from Poway, Asheville, Oakland, and Durand - mentioned that general community building was an important aspect of these projects. For example, Durand said "it's a very good community event actually, that people are, you know, meeting other people for the very first time." The city's community engagement also extended to engaging private businesses in food growing projects, and creating a pleasant space for people to meet at a minimal cost to the city. Similarly, Oakland mentioned that the city's garden space had created an area that families and children enjoyed. In addition, Durand, Long Beach, and Asheville specifically stated that one community engagement benefit of food landscaping projects was that residents would engage with the space and then incorporate these growing practices into their own yards. One city specifically said:

> Ideally what we love to see, and sort of why we fund…the engagement with the park and the workshop series is to pique your interest accidentally, maybe engage with the

> educational content and then go to a workshop or plant some trees on your own property…sort of escalating levels of engagement with the process.

In addition to educational and community benefits, one respondent mentioned the potential for economic development. Durand discussed the success that they have had with their program so far, explaining that one hope for the program's future was that it would bring in people from outside of the city who were interested in seeing their space and learning more about their program.

Environmental: In addition to social benefits, six respondents mentioned that environmental benefits were an important aspect of food landscaping. Three respondents discussed the environmental benefits related to sustainability practices. Specifically, Durand mentioned that through their project, the city hoped to be better stewards of the earth, and that their project has specifically helped local pollinator populations. Also, their project focused on removing invasive species from the planting areas and using local green waste to create compost and build soil health. Long Beach, which runs the Willow Park project through the Office of Sustainability in partnership with the Department of Parks, Recreation, and Marine, described the program's sustainability benefits as connecting people to natural processes, while also creating sustainable practices like compost piles through their sustainability demonstration areas.

Three cities also discussed environmental benefits such as beautifying an area and providing varied uses for a space. Durand, whose food landscaping project is included under the city's beautification program, mentioned that residents took pride in their space and made an effort to clean more public areas. Asheville also discussed the change in space, saying that there was an additional value added once food landscaping had been incorporated. Specifically, Asheville mentioned the path that runs through the George Washington Carver Park to Downtown, saying that the addition of food landscaping had enhanced the walk.

In addition to incorporating environmentally conscious practices that are on view to residents, two Poway respondents specifically described the ecosystem benefits of food landscaping. Both respondents described the importance of increased shade that can decrease the urban heat effect, in addition to increased oxygen levels that come from these landscaping projects, with one person saying, "obviously it provides shade if there are trees, it can provide additional oxygen to the environment." In addition, one Poway employee specifically mentioned that these projects have the potential to clean the air.

Health: Lastly, five interviewees mentioned health benefits associated with food landscaping projects. All four Poway employees said that a potential benefit of these projects would be local access to food, with one Poway respondent building off that by saying these projects could benefit lower income households specifically. This is similar to Long Beach's response, in which they mentioned that their program donated food to a local food bank when it was located in front of City Hall. In addition to food donations, Long Beach also mentioned that one health benefit of food landscaping was that it could teach residents about better nutrition and eating habits, and mentioned that a related program had cooking classes that described how fresh produce could be used to create healthy meals.

Barriers to Food Landscaping

Interviewees were asked to describe the perceived barriers to food landscaping problems; for cities with existing projects, they were asked to describe the barriers they had faced, and for the City of Poway, employees were asked what barriers they could imagine within the city.

Responses were categorized into two groups: bureaucratic and community barriers (Table 2).

Bureaucratic: All eight participants discussed bureaucratic considerations in some form as being a barrier to food landscaping projects, including: maintenance, city apathy, funding, and water.

Seven city employees mentioned that maintenance planning and costs act as a barrier to food growing projects. Both Long Beach and two Poway employees mentioned that volunteer groups, which are often relied on in these projects for site maintenance, can be unreliable and act as a barrier to long-term maintenance. One Poway employee also mentioned that harvesting can specifically be difficult for cities to fund and manage, while another Poway employee said, "who's going to prune them, who's going to pick up the dead fruit, who's going to fertilize them, who's going to repair the irrigation, who's paying for the water?" In addition, Durand mentioned that their volunteer groups were not a barrier, but that if the city had had to maintain the entire project, rather than having that strong community and volunteer support, this project may not have happened.

In addition to maintenance, six respondents discussed that city disinterest or fear can act as a bureaucratic barrier to food landscaping, with one respondent saying, "I'm the last thing that they're thinking about right now." Lack of city interest can result from a number of things. Three respondents specifically stated that city priorities are focused on other things and as a result are not as focused on local food production. Two of those respondents worked for Poway, and one person specifically stated that elected officials can act as a barrier to these projects because they choose to focus on other priorities. Three Poway employees also stated that the city may not be interested in these types of projects because there is no obvious monetary return, with two of the employees pointing out that the already existing citrus groves in Poway cost more money than they make - these groves are not open for public use. Four individuals also mentioned that liability can act as a barrier for the city to pursue these projects, with Long Beach and Oakland specifically referencing that people who were experiencing homelessness were building encampments in certain areas and dumping litter. Two Poway employees also discussed liability, with one mentioning that the city would need to be insured if anyone is consuming produce grown on public land, with the other saying that insurance would be required if anyone got hurt on public lands while interacting with these areas.

A third bureaucratic barrier that five respondents mentioned was general funding. Long Beach, Oakland, and two people at Poway discussed that finding funding for either a city or private workforce would be a barrier. This could include either the city funding these projects or finding and partnering with private businesses or nonprofit organizations to run the project. In addition, two Poway employees specifically discussed that the city would most likely need to fund a new city position, which would act as a barrier, and another Poway employee mentioned that one funding barrier specific to Poway is that the city does not have an employee who applies for grant funding, which other cities may rely on to start and maintain food landscaping projects.

Lastly, three individuals mentioned that water can be a barrier to these projects. All three individuals worked for the City of Poway, and described different aspects of the barrier. One employee said, "the big [barrier] now is the cost of water…and the maximum applied water allowance…which is part of water conservation initiatives." The second employee mentioned that applying for a permit from the water board may act as a barrier to initiating these types of projects, and the third employee mentioned that the cost of water and who was paying for it would act as a barrier.

Community: All eight interviewees discussed the community barriers to food landscaping projects on public land. Lack of community interest and understanding was mentioned as a

community barrier by five people. One Poway employee stated that these projects would have to be community driven, and that the community had yet to express an interest or a need for this type of project; therefore, the city had not developed this idea. Another Poway employee stated that the community would not need this type of project because they could use their own yards to produce food instead. Two respondents mentioned that lack of community understanding specifically was a barrier. Durand said that their edible food project, while now successful, was initially not understood by the community, including how they should interact with the space, which created an initial barrier to community interest. The second respondent, who is a Poway employee, mentioned that a lack of community understanding was because the urban agriculture project that Poway does have - the citrus groves - only serves one purpose and is not open to the public. This might convince community members that future urban agriculture spaces only serve select people, rather than being open to the community.

In addition to a lack of community interest, three individuals mentioned that tension between land uses could act as a barrier, or was a current barrier to an existing project. Asheville discussed this issue, saying:

> I think the biggest challenge is just competition for space and priorities and, especially with parks and rec, you know they have a big beautiful field, and some people are like 'farm' and other people are like 'baseball' and that's really the major tension.

Also, two employees from Poway said that food landscaping could interfere with already existing land uses, such as a soccer field or an open park space, thus acting as a barrier to projects. One Poway employee said:

> I think picking the site is going to be a huge barrier. I feel like the residents have their parks, their sports fields. They value those things…selecting a location…would have to be very strategic in not taking away an amenity.

Lastly, two cities mentioned that one barrier for the community was actually the project structure. Both Oakland and Long Beach said that their edible landscaping spaces were not publicly accessible either outside of certain hours (Oakland) or outside workshop times (Long Beach). This created a privileged environment, in which only people with those free times had to access the spaces.

Aside from one mention of pesticide use and stormwater pollution, there was little discussion of environmental barriers that may exist, with one person saying that any pesticides used might end up in the storm drain.

What are the mechanisms and pathways to implementing these projects?

Participants were given a series of questions in which they were asked to describe the implementation mechanisms behind food landscaping projects. For the City of Poway, this included questions on the types of information that would assist with project implementation, including partnership information. For cities that already had existing projects, they were asked how the projects got started, how the program is funded/managed, and some of the things that could have streamlined project implementation. From their responses, mechanisms for project development were organized into five categories: community, city, partnership, policy, and education mechanisms (Table 3).

Community: All eight interviewees discussed the importance of community for project development and implementation. Seven individuals responded that an important community mechanism was having projects driven by community desires, with one person saying, "there was an effort to plant edibles…based on advocacy from our community." Two Poway employees discussed how the community is an important and necessary driving force behind city-led projects, and that community advocacy is needed for these projects to be considered by the council. Another Poway employee mentioned that this is important especially because taxpayer money would most likely be used for these projects, so community-driven projects are more supported. One example of a community-driven project was provided by Long Beach, who said that their project is run through the Office of Sustainability, which was only created as a result of a resident-led commission. Similarly, one Poway employee said that one way to introduce these projects would be through the creation of a committee composed of interested residents.

Another community mechanism that five interviewees mentioned is the community as active participants in the development process, either through co-creation or through active engagement with the space. Durand discussed that having an active community was an intrinsic part of program development. The program relies heavily on community donations, both through money and time, and the city hosts events where residents come out and help maintain the space. Asheville also discussed active community engagement, and mentioned that the community had already been using public land for food growing, but became more invested in partnering with the city. Moving forward, the city and community organizations worked together to design programs, which led to the city creating policy around local food. In addition, Asheville mentioned that coalition building, both internally and externally, would have made program implementation more streamlined.

Lastly, four respondents mentioned that an important community mechanism for these projects was community engagement, in which the city reaches out to community members. Durand specifically mentioned that if they could start the project over again, it would have been easier if the city had engaged the community from the outset in project design and use, rather than relying completely on city initiative. Instead, the community did not know how to engage with the space once it was designed because the city had not communicated with them, although the city has still seen success with the project. Asheville specifically focused on making these projects relevant to community members, so that it is something that they are invested and interested in. One Poway employee also mentioned the importance of media for this role, and the utilization of not only social media but also print media, in order to reach as many people as possible. This is especially important because it can be difficult to reach residents on an individual level.

City: In addition to community mechanisms, all eight respondents also discussed the importance of city mechanisms when implementing these projects. In particular, seven individuals mentioned the importance of funding. Oakland and two employees from Poway said that projects would have a higher chance of being considered if a fully funded and organized plan was provided, with one Poway employee saying, "I think if somebody were to come in with a fully-funded idea where there's no net loss for the city and the long-term maintenance has been worked out, that's when it starts to become a no-brainer." Long Beach and Durand also mentioned that general funding considerations must be taken into account. In addition, Long Beach and one Poway employee said that looking at ways to offset costs with grant money and other funding opportunities would be an important consideration, with Long Beach specifically discussing grant funding for a tree planting program, and the potential to work with teenagers to train them through a grant program. Asheville discussed that their program is specifically

focused on initially using a city-funded model for these sites, and then building internal capacity within a community in order for them to successfully take over part of the project maintenance.

In addition to funding considerations, four people said that it was important to have buy-in from the city in general. Asheville explained that the ideal scenario would be to have buy-in from all departments, discussing the fact that a lot of time is still spent reassuring other city officials and departments that the program is important and will last, and that coalition building at the program's onset would have alleviated this task. Both Long Beach and Oakland also mentioned that it is important to have city buy-in in order to make the programs last, with Durand also mentioning that seeking assistance from other departments, such as the city's health department, was important for the success of the program.

Partnerships: A third mechanism that all eight participants discussed was the importance of partnerships for project implementation. All four cities that have existing food landscaping programs said that partnerships were important for the program's success, while all four Poway employees mentioned that partnerships would be important for program implementation and success. Five respondents said that volunteers would be an important partnership addition for these programs. Asheville mentioned that their program focused on building capacity within the community so that they could take over partial maintenance of the project, while two Poway employees described the volunteer group that already cares for some trees in one public park. In addition, one Poway employee mentioned that the city's hiking trails are already successfully maintained in part by a volunteer organization. Durand also has volunteer partnerships that are important for project implementation, and make up a large part of the maintenance crew.

Five respondents also mentioned that partnerships with nonprofit organizations would be a valuable mechanism, especially if they could maintain the space at a discounted price. Asheville said, "we have a service contract with Bountiful Cities, which is a nonprofit urban agriculture organization that does the maintenance by way of Community Work Day," in addition to their city maintenance crews, while Oakland's edible demonstration space at Lake Merritt relies on the local Master Gardener chapter.

One Poway individual said that a potential partnership could be with local farmers.

Policy: A fourth mechanism that four respondents discussed falls under policy. One Poway employee discussed that these types of projects can be included under various sections of a city's general plan, mentioning the safety element as an example, and that another city they were aware of included local food production under the health and wellness element. In addition, Long Beach and Oakland both mentioned that these projects can consider future needs that could be included in policy; Long Beach discussed the inclusion of these projects for sustainability and climate resilience initiatives, and Oakland said that food sovereignty can be included in project implementation.

Education: Lastly, three people mentioned educational mechanisms for project implementation. Long Beach and one Poway employee said that these projects can teach about an area's history and fit into that narrative, which can act as an impetus for local projects to move forward. In addition, both Asheville and Long Beach discussed the incorporation of education into program offerings, which can grow a program's scope. Both cities mentioned that they hoped their programs would encourage people to incorporate these practices into their own home spaces, and Long Beach specifically mentioned that the focus on healthy living could be an impetus for these programs moving forward.

Table 1: Benefits

Category	Subcategory	Response Examples
Social (6)	Education (5)	"Families grow up around urban agriculture and they can start to understand where plants grow"
	Community Engagement (4)	Creation of events that engage both families and private businesses
	Economic Development (1)	Eco-tourism and economic growth
Environmental (6)	Sustainability (3)	"The city is taking steps to try to be…better stewards for Earth"
	Beautification (3)	Fighting for the citrus groves because of their aesthetics
	Ecosystem (2)	Increase in oxygen, reduction in urban heat island effect
Health (5)	Local Food Access (5)	"The most immediate benefit would be the potential of food or fruit"
	Healthy Eating (1)	Teaching healthy eating habits and cooking skills

Table 2: Barriers

Category	Subcategory	Response Content
Bureaucratic (8)	Maintenance (7)	"It always comes back to the first question, is who's going to maintain those"
	City Disinterest (6)	Elected officials are focused on other priorities. "I'm the last thing they're thinking about."
	Funding (5)	General program funding and funding new positions
	Water (3)	"The big [barrier] now is the cost of water…and water conservation initiatives"
Community (8)	Community Disinterest (5)	"Not everyone's going to be on board, even probably residents, not everyone wants that."
	Land Use Tensions (3)	"I think picking the site is going to be a huge barrier. I feel like the residents have their parks."
	Project Structure (2)	Spaces are not publicly accessible; spaces have hours and fences.

Table 3: Mechanisms

Category	Subcategory	Response Content
Community (8)	Community Driven (7)	"There was an effort to plant edibles…based on advocacy from our community."
	Community Partners (5)	Sustainability department created because the community called for it
	Community Engagement (3)	Necessary to engage the community through social media and print media
City (8)	Funding (7)	Fully funded plans are important for initiating projects
	City Buy-In (4)	Important for city to believe in project and for departments to work together
Partnerships (8)	Volunteers (5)	"Volunteers are probably going to be very important."
	Nonprofits (5)	"If there was a nonprofit organization that would do this at a reduced rate, that would offset the costs."
	Farmers (1)	Could provide another local group to work with
Policy (4)	General Plan and Future Initiatives (4)	Projects can be included in various general plan elements, in addition to future sustainability and food sovereignty initiatives
Education (3)	Area History (2)	"Especially with our rural character, it's something that could be a driver for people who are interested."
	Educational Programs (2)	Potential for educational offerings as a mechanism.

Chapter 5: Discussion

Overall, interview responses supported and emphasized many aspects of the literature. Social benefits, including education and community building, were listed as important aspects of food growing projects by a majority of respondents. This is consistent with surveys that asked community members what they valued most about urban agriculture projects, in which social and cultural benefits were ranked as more important than food production (Guitart, 2012; Newell, 2022). Considering that park spaces are currently designed to provide people with services, and often do not make a profit, these benefits can fit into the current park structure of providing more community meeting spaces and places for cultural exchange, while providing additional benefits such as food production, healthy living styles, and ecosystem benefits. However, as park spaces are viewed more as a provider of goods moving forward, and potentially as a space for profitable food production, how urban parks are viewed in the United States could change (Cranz, 2008; McLain, 2012; McLain, 2013)

While respondents recognized the potential importance of these programs, these interviews also served to emphasize how cities are currently focused on other priorities, and not concerned with the potential change in the purpose of park spaces. While this study was able to interview four cities that currently have some form of food landscaping on public lands, it is clear from interviews with the City of Poway that these projects, and the future potential for public parks, are still lower in priority than other projects. For the City of Poway, this is in part because many families in the area have single-family homes that could allow them to grow food on their own lands, listed by one respondent as a reason not to consider these projects. However, as more suburban and peri-urban areas are developed and urbanized, multifamily dwelling units will be prioritized over single-family homes, allowing for food growing and food landscaping to shift to publicly available lands.

These interviews also showed the importance and potential for volunteer and nonprofit organization partnerships to increase the success and affordability of these projects. This suggests that moving forward, as urban agriculture continues to increase and as public parks are considered for these projects, partnerships may be intrinsic for cities when designing these programs, which is in keeping with the belief that successful public projects will need partnerships moving forward (Halvey, 2021). This is especially apparent in the need for co-creation between cities and community members, which multiple respondents mentioned, in addition to maintenance and funding assistance. This can also increase community understanding of these spaces, since one concern that respondents mentioned was the tension between land uses, and the belief that these projects would interfere with other park spaces like playgrounds and recreational areas. However, this lack of understanding is more a reflection of the lack of literature on food landscaping in public parks, which is designed to be integrated into the landscape rather than interrupt current land uses. As more cities incorporate food landscapes moving forward, their purpose and integration will become more apparent.

Moving forward, as public park structures shift and a fifth type of urban park is developed, food landscaping and urban agricultural projects may be an important addition to create more sustainable and productive urban parks. From these interviews, it is clear that the environmental benefits of food production on public lands is an important consideration, which would add benefit to these spaces and provide more advantages for the community. In addition, responses that detail the reduction in the urban heat island effect and an increase in purified, oxygenated air represent benefits detailed in the literature (Corburn, 2008; Lin, 2017). It is clear from these interviews that this shift in park space structure and purpose will create greenspaces

that are integrated into the community and reflect cultural needs. As more of these spaces are created, shifting parks from pastoral spaces to more productive and sustainable areas, food landscaping will become an important addition to the literature on urban agriculture, although currently there are few studies that reflect the city and community interest in food production on public lands.

Chapter 6: Conclusion

This study was designed to look at the benefits, barriers, and mechanisms for incorporating food landscaping in public parks. Four cities that have already incorporated food landscaping of some kind on public lands were interviewed to discuss project history, success, and perceived benefits and barriers, while the City of Poway in Southern California was used as a case study to look at what might stop cities from considering and implementing these types of projects. Results suggest that cities and communities have an interest for designing and implementing food landscaping on public lands, but there is a current lack of motivation to fully pursue these projects. This study provides cities with important information on the barriers that may exist for these projects and the benefits that these projects can create, in addition to providing them with information and steps on how to implement these projects through the included implementation guide.

This study found that there are a wide variety of project benefits separate from monetary advantages that cities should take into account, including community cohesion and educational benefits, in addition to both environmental and health benefits. Likewise, interviews revealed a variety of barriers that may exist and which may keep cities from considering these projects. These include bureaucratic barriers such as funding and maintenance costs, in addition to regional concerns such as water. Community needs and interests can also act as a barrier to these projects, including the perceived lack of community interest and the resulting lack of city impetus for projects. However, of the four cities with existing programs, three of them were the result of city initiative over community drivers, and the fourth city was the result of a combination of community and city interest, suggesting that cities are important drivers for these projects, and that communities realize and appreciate the benefits of these spaces once they have been provided. In addition, responses from the four cities with food landscaping projects suggest that these cities were able to overcome many barriers and successfully implement local food growing programs. Successful implementation and lack of major ongoing barriers from these projects suggests that cities like Poway, which are hesitant to pursue these programs, are allowing temporary barriers to stop or hinder project development. As cities consider food landscaping projects, it is important to take the myriad benefits that all eight interviewees discussed into account, which may help cities overcome these barriers.

These results were used to inform the accompanying implementation guide for cities to use when developing food landscaping projects. While there are various implementation guides designed for community gardens and other forms of urban agriculture, there are currently no guides that focus on incorporating food landscaping into public parks, and few studies to reference when considering these projects. As a result, cities that choose to implement these programs have few projects to emulate or guides to follow, which this implementation guide will assist in changing. Future studies that can further inform project implementation will be important as urban areas grow and localized food production gains importance. Hopefully, this report and guide will act as an important starting point for both cities and future research to expand on.

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Implementation Guide
Food Landscaping in Public Parks

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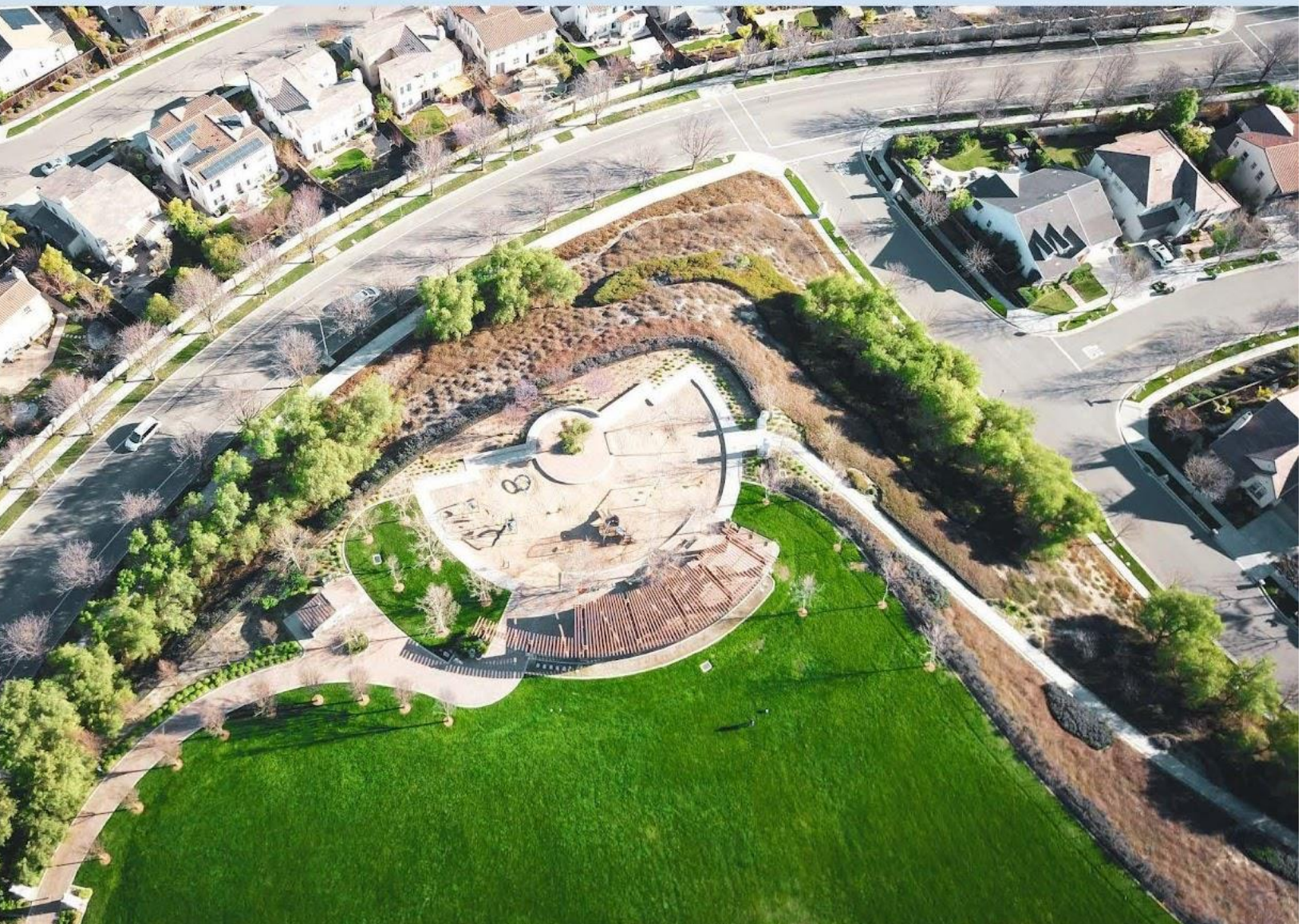

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GUIDE OVERVIEW:

This guide is designed to aid city governments with incorporating food landscaping onto city-owned and city-managed public greenspaces and parks. As more cities experience increased urbanization, more residents are turning to edible plants as an important addition to the landscape. Urban agriculture is often seen as a popular way to grow food as climate change affects agriculture and a way to create more sustainable and healthy communities. However, not many cities have incorporated food landscaping onto publicly owned and publicly accessible land, which this guide hopes to change.

Urban parks are open spaces that are devoted to community and residential use, and are designed to provide a number of benefits. However, this guide introduces a new benefit for these lands, which is publicly accessible produce. Food landscaping, which is a form of urban agriculture, has the potential to benefit city governments, organizations, communities, and residents, and can also provide important ecosystem services. This guide provides steps for cities to follow in order to incorporate these models into public park spaces, and includes information on benefits, opportunities, site information, and potential barriers, in addition to important information on policies and potential frameworks to implement at a city level. This implementation guide uses the City of Poway, located in Southern California, as an example to apply general information to. However, this guide also recognizes that each city has individual needs; this guide is the framework that acts as the first step to these projects.

This guide:

- Provides a step-by-step framework and further resources
- Highlights the benefits of food landscaping on public lands
- Includes information on funding and management
- Points out potential barriers for cities to consider when implementing projects

DEFINITION: Food Landscape

A food landscape, also known as foodscape or edible landscape, is one that incorporates edible plants into a landscape. These landscapes can be made up entirely of edible plants, or they can incorporate food producing perennials and annuals alongside ornamentals. These landscapes provide a variety of services, and are designed to be aesthetically pleasing while also providing edible produce. Food landscaping is considered one component of urban agriculture, and can be incorporated into other landscapes without disrupting the existing land use. These spaces are often incorporated onto residential land, but can also appear on publicly maintained land such as parks and schools. Unlike other forms of urban agriculture such as community gardens, which may only be available to some residents but not all, food landscapes on public lands remain open to every member of the community.

SECTION 1: BENEFITS OF FOOD LANDSCAPING

Urban agriculture has been shown to have numerous benefits, which include benefits associated with both ecosystem and social services, not to mention food production. Urban agriculture projects generally take place on private land, or public land that is managed by an outside organization or group. In addition, many urban agriculture projects like community gardens may only be open to select individuals, rather than the general public. The current structure has led to the oversight of millions of acres of land that have been set aside for public parks and greenspaces, which currently provide single uses like sports fields, dog parks, or playgrounds. These areas can be re-envisioned to include food landscaping, which would provide numerous benefits associated with urban agriculture, while also retaining land set aside for the community.

Food landscapes can provide the following benefits:

- Air and water filtration, and reduction in stormwater runoff and associated pollution
- Climate change mitigation, like reducing the urban heat island effect
- Educational benefits, including increased food literacy and environmental conservation
- Increased physical benefits associated with time spent outside
- Potential for localized food production, which decreases emissions related to agriculture
- Greater community cohesion and cultural exchange
- Area beautification
- Closed loop systems associated with composting and greenwaste recycling

Education

Urban agriculture is not only associated with food benefits, but is also associated with educational contributions to the local community. Food landscaping is no different, and educational advantages should be considered when these spaces are incorporated into public parks. This is especially applicable if public parks are located next to schools, which can in turn utilize these areas as teaching tools in the curricula.

These spaces also have the potential to teach families about healthy eating choices through providing access to a local source of food and related workshops. This can in turn impact the types of food that people choose to eat, including decreased meat consumption while increasing fruit and vegetable choices. This can extend to other aspects of the city government, including offering a list on cities' websites detailing fruiting trees that are suited to the local environment, and teaching people how to produce their own food at home. By creating these areas that can both produce food and act as a demonstration, people have the potential to apply these lessons at home.

Education is not just limited to food production and garden workshops, but can extend to lessons on an area's history as well. Many cities in the United States and in California specifically have rich agricultural stories that can be incorporated into local food growing projects. These projects can teach people about an area's history, connect them to the people who lived there before them, and educate them on agricultural skills that urban populations have become separated from.

Poway:

Poway has a large school district that would benefit from additional learning tools. Many of these schools are located next to public parks, e.g. Garden Road Elementary School is located next to the Garden Road Neighborhood Park, Midland Elementary School is next to Old Poway Park, and Poway High School is near Lake Poway. School gardens are already a popular tool used by teachers to build off of classroom content. Having schools located next to or near to food landscaping could allow for these spaces to be incorporated into curricula for schools that do not have access to a garden, providing students and teachers with a more hands-on form of learning. In addition, Poway High School has a Future Farmers of America chapter that may benefit from food production lessons that could be taught using food landscaping.

Additionally, the educational elements of food landscaping are not limited to onsite instruction, but can extend to the integration of these landscaping decisions on personal property. Poway is a suburban community with a high number of single-family homes. These food landscaping programs have the potential to educate Poway residents on other ways to use their land, including producing food at home for their families.

Poway also has a strong agricultural history. Since the late 1800s and early 1900s, settlers relied on agriculture as the main source of income, growing varied crops such as grapes, peaches, alfalfa, and apricots. However, the city has since transitioned away from agriculture as a revenue source. While agriculture may no longer be a major part of the city's fabric, this history can be incorporated into food landscaping projects and used to teach residents about the area's past.

Community Services

When discussing the possibilities of incorporating food landscaping onto public lands, some cities and community members express worry that these initiatives can take away from other park space purposes that already exist, such as recreation areas and open spaces. This is not the purpose of these landscapes. Rather, edible plants, especially perennials like trees and bushes, are incorporated into the existing landscape rather than detracting from it, providing additional benefits while still retaining the original purpose of these spaces. This can beautify an area, create economic revenue as a tourist destination, and increase the pride that a community has for their city and public spaces.

Community services are often listed by city residents as the main reason or one of the main reasons to incorporate urban agriculture into an area, including the social and cultural benefits that these spaces provide for community members. This can include greater community cohesion and engagement, since these spaces are designed to bring people together and increase interaction. In addition, food landscaping projects, especially if there is co-creation between community members and government officials, can lead to greater cultural exchange through the incorporation of culturally diverse foods.

City Benefits

In addition to educational and community benefits, food landscaping projects contribute to the

wellbeing of the entire city. As more cities shift to incorporating climate friendly and sustainable projects, food landscaping is an important advertising tool that cities can include on their websites and use when applying for grant funding. Cities can also use these spaces to create marketing and educational campaigns that not only engage the community, but also residents and government officials outside of the city who are interested in initiating similar projects. This is in part because food landscaping can beautify an area and enhance a city's image. In addition, food landscaping projects can lead to important policy initiatives and new ways to improve a community.

City Highlight: Durand, Michigan's Beautification Project, which includes their edible landscaping initiative, provides numerous community benefits, such as meeting spaces and food production. In addition, the city is hoping to benefit economically from this program, by becoming a city that is known for its innovative localized food production projects taking place on public lands.

Climate Change and Resilience

As climate change impacts are felt around the world, and as more people start to recognize that human-caused climate change is a major issue, more cities are moving to initiate projects that can lessen their carbon footprint, incorporate adaptation techniques that prepare an area for climate impacts, and create more climate resilient communities. In addition to other avenues like building electrification and public transportation options, cities are beginning to pay more attention to urban agriculture, both to lessen emissions associated with traditional food production and to create more localized systems that community members can rely on as global food supply chains are disrupted by climate change.

There are also a number of ecosystem benefits associated with urban agriculture. Integrating food landscaping into public park spaces has the ability to increase an area's livability and resilience to climate change. More trees mean an increase in air and water filtration and added oxygen, while increased shade canopy can reduce the higher temperatures associated with the Urban Heat Island Effect. If spaces incorporate bioswales, this can reduce flood risk that is associated with an increase in extreme storm systems from climate change. In addition, by adding in more diverse plants, this can increase an area's biodiversity. These considerations can in turn lead to greater policy inclusion, especially as more states and local governments incorporate and require climate-initiatives and goals.

SECTION 2: PERCEIVED BARRIERS

While food landscaping programs have the potential to add numerous benefits to public parks, these projects have generally been overlooked and instead left to private and nonprofit agencies to coordinate. This is partially because barriers do exist to these projects, and can be overwhelming for cities that are interested in implementing food landscaping on public land. While the benefits to these projects have been listed above, and hopefully are used to support future programming and show the value of these projects, barriers are listed as well. The remaining content of this guide is designed to aid cities in overcoming these barriers and more easily initiating these programs, and will address these concerns in turn.

Some Barriers to Projects:

- Liability, including insurance requirements and vandalism considerations
- Funding constraints, including additional staff needs and project funds
- Maintenance concerns, both funding and staffing for maintenance
- Water limits and price, especially important in drought-stricken regions
- Reliance on partnerships, including volunteers, which can create project uncertainty
- Policy barriers that can restrict food landscaping and community interaction

Poway:

Poway, which is located in Southern California, must consider water barriers and conservation efforts when developing food landscaping projects. Currently, the city has one major example of urban agriculture, which is the three citrus groves that are located on public land and managed by a private company. These groves cost the city a considerable amount of taxpayer money to maintain, in addition to a water bill of roughly $60,000 a year for all three groves. Understandably, the city views water costs as a considerable barrier to food landscaping in public parks. However, food landscapes would remain open to the public, unlike the current citrus groves, and could either use recycled water or drip irrigation and mulch to reduce water needs. In addition, if the city or the private maintenance firm are no longer interested in maintaining these groves and decides to remove them, that water could be instead utilized for a project that produced food that everyone would benefit from.

In addition to water costs, which will most likely increase as drought conditions in the west intensify, there are water conservation measures in California that must be taken into account when considering these projects. This includes the Maximum Applied Water Allowance (MAWA), which is used to set a maximum water limit for landscaped areas, and is based on the water needs of the plants. Unirrigated spaces like native vegetation are not included in these calculations. However, future measures like an increased supply in recycled and desalinated water may change the approach to irrigating public park space for food production. Provided later (pg. 36) is a list of drought-tolerant trees that are well-suited to a Southern California environment. Proposing landscaping with drought-tolerant and fruit-producing trees is an important step in designing these spaces, and can assist with water requirements. In addition, the State of California continues to prioritize local food growing initiatives, which may lead to changes in water restrictions.

SECTION 3: COMMUNITY INTEREST and GETTING STARTED

Community guidance, input, and interest are all key variables when considering food landscaping projects in public spaces. Research shows that urban agriculture projects provide direct benefits to members of the community, with residents specifically discussing greater community cohesion and cultural exchange as two major benefits of these projects, in addition to providing a space for people to learn together. As such, it is important to first understand what the community expects with these projects, what they hope to see featured, and how they plan to interact with these spaces.

One barrier that cities may experience with these projects is the belief that community members are not interested in these programs because they are not discussed at council meetings. However, urban agriculture projects are still somewhat uncommon in some areas, and communities might not be aware that food landscaping can take place on public lands, or that it is even possible to grow food in their community. Likewise, other urban agriculture programs on public land have the potential to disrupt current land uses, which can make community members wary of these projects. For example, using a park for a leased community garden structure can transition a community space from one use to another, which can cause community backlash if people were utilizing that space before. Rather than relying on community members to suggest food landscaping in parks, it is important for cities to recognize that reaching out to the community is an important first step in project development.

It is important with food landscaping programs that residents understand that these projects will not disrupt or remove the recreational public land uses that already exist, such as sports fields and picnic areas. Since these concerns and a lack of understanding about project design can stop communities from requesting these projects, this barrier can be overcome by designing a community survey that can comprehensively gather information on community interest. Surveys previously designed for community garden programs can be updated for food landscaping and sent to residents. Survey designs for community gardens are included in the resource page at the end of this document, and can be adapted to other project structures.

By interacting with the community at the start of these projects rather than after implementation, community members may better understand what these spaces are for. Some successful food landscaping programs mentioned that an initial barrier to the program was that the community did not initially know how to use these spaces. This was a result of implementing these projects without first engaging with the community. As a result, community members did not know that produce was free to take, that they had access to some plants and not others, or even when certain vegetables were ripe. This introduces educational opportunities and moments for city officials to engage with their constituents and design something that they want and need.

City employees mentioned that engaging with the community through a social media page prior to program implementation is an important first step in gauging community interest and educating about the program. This can also include posting notices in the local newspaper and sending out letters, in order to reach as many people as possible. Once the project has been implemented, community engagement doesn't end. Rather, educational workshops can be designed as an ongoing addition to these spaces, in addition to educational signage that informs people of plant names, seasons and ripeness, and other interesting information.

Poway:

Currently, there are few sites in Poway that incorporate urban agriculture elements. The example most often cited are the three citrus groves that are planted throughout the city, including two lemon groves and one grapefruit grove. These spaces are managed through a third-party company, and the fruit is sold for profit. These groves are closed off to the community, even though they are planted in neighborhoods, and residents can be fined if they pick from these trees. Because this is the well-known example of urban agriculture in the city, this may instill the belief that other food producing spaces would similarly be closed to the community. This current project structure may add to the apparent lack of public interest and comment at council meetings, which was cited in city interviews as being proof that residents are not interested in food landscaping projects. However, no community assessment or survey has been distributed to show otherwise, and would be an important first step in determining what the community wants.

SECTION 4: FINDING a SITE

After community needs are assessed and there is a greater understanding of expectations, the next step is choosing an appropriate site or sites for these projects. Food landscaping can take place on a wide variety of public-owned land, including green strips, planter boxes, outside government buildings, etc. However, parks offer a convenient starting place before branching out to other public lands, providing acres of open space that are often not used to their fullest potential and which are heavily accessed by the community.

Most metro areas have park spaces included in their city development plans. These green spaces are devoted to public use, and are designed to serve multiple purposes. These purposes include recreation, conservation/preservation, and play areas for children, and often consist of lawn areas and shade trees. Aside from spaces set aside for conservation purposes, which cannot and should not be altered, food landscaping can easily be incorporated into park spaces without impeding these other public land uses, instead adding to the list of benefits that these spaces provide.

There are a number of things to take into consideration when choosing a site:

- Sun exposure, as most food producing plants and trees require 6-8 hours of sun a day
- Existing conditions, including soil health and potential contaminants and digging restrictions
- Pre-existing use of the space and limitations
- Terrain, including erosion and runoff considerations, and public and city accessibility
- Existing protected vegetation, including native/endangered or historically important
- Location, since parks located next to housing and schools may get higher visitation

City Highlight: Asheville, North Carolina has a number of urban agriculture initiatives, including community gardens, lot leasing programs to encourage local food producers, and an edible landscaping program. These food landscapes span the city, and are often planted on public land and maintained by the city and community organizations. At the outset of the program, the city chose to focus on small, attainable goals, like planting service berries in various places, rather than a large project. By starting and completing one project before moving onto another, the city ensured that the spaces were in line with community interests, utilized by the residents, and well-cared for.

Poway:

The City of Poway currently has 25 park spaces listed on their website and also mapped through their GIS program. These park spaces range from .2 acres of land to almost 26 acres of land, and serve a variety of purposes within the community. Some of these sites are set aside for conservation or cultural purposes, including the Blue Sky Ecological Reserve, the Pond, the Kumeyaay-Ipai Interpretive Center, and Veteran's Park. Some park sites are specifically for recreational purposes, such as the Poway Community Swim Center and the Poway Skate Park, although other recreation-specific park spaces have land that could incorporate food landscaping, including the Valley Soccer Field and the Poway Sportsplex. Choosing a site might also depend on other current uses for the space besides recreation. Old Poway Park is in the city's historic district, and would be a fitting place to incorporate food landscaping. These projects could include educational information on Poway's agricultural history, which would be fitting for the space, and could be utilized by the nearby Midland Elementary School as an educational tool.

In total, there are 18 sites that could be utilized for food landscaping. Eight are specifically labeled as neighborhood parks and range in size. One example of a neighborhood park is the Garden Road Neighborhood Park, which is four acres of park space located next to Garden Road Elementary School and which includes open space and a play structure. This is an excellent example of a food landscaping space that could serve multiple purposes. Any food landscaping could be used as an educational space for children, and could lead to the implementation of a school garden as well. In addition, sustainable landscape designs like bioswales could be incorporated into the landscape and lessen the future flood threat from the creek that runs through the park. This type of design could be implemented throughout other parks in Poway, and provide neighborhood communities with food growing opportunities and other benefits (City of Poway, 2019).

Potential Park Sites			
Park Name	**Acreage**	**Park Name**	**Acreage**
Valle Verde Neighborhood Park	4.9	Arbolitos Sports Field	5.7
Adobe Ridge Neighborhood Park	1.5	Aubrey Park	8.3
Silverset Neighborhood Park	10.9	Arbolitos Mini Park	.9
Old Poway Park & Railroad	4.9	Poway Community Park	14.9
Hilleary Park	10.8	Valley Soccer Field	2.3
Starridge Neighborhood Park	25.9	Poway Sportsplex	15.2
Poway Oaks Neighborhood Park	.4	Garden Road Neighborhood Park	4.4
Sycamore Creek Neighborhood Park	.19	Sycamore Creek Neighborhood Park A	.9
Lake Poway Park	24.6	Bette Bendixen Park	.8

Incorporating Food Landscaping and Choosing Plants

While many food landscaping programs focus on both perennial and annual plants, it can be easier and more cost-effective to start designing a landscape with fruit trees, as they take time to mature and can help define a space moving forward. It is important to choose trees that are suited to the environment, rather than plants that are invasive, require different conditions (such as chill hours or water requirements), or are high maintenance. In addition to fruiting trees, perennial bushes should also be considered, and can include things like berries and guavas. As perennials are added to the landscape, it is important to include signage that can educate the community on varieties, fruit production, and seasonality, so they know how to interact with these plants – including when to pick them – and can in turn incorporate these plants into their own spaces.

At this point, it is also important to consider liability concerns. While a public entity may not be held liable for any natural element of a public area, there are concerns that cities could be held liable if people are consuming products grown on public lands. Thus, it is important to decrease the reliance on harmful pesticides, to legibly mark each plant that is available for consumption, and to remove or avoid including toxic plants in the area.

Poway:

As mentioned above, it is important to choose plants that are suited to an environment. Southern California is a Mediterranean climate that receives little rainfall, which will only be exacerbated with climate change. Poway is located inland, and has a higher evapotranspiration rate than other areas of San Diego County. While California is known for the produce that the state supplies to the rest of the world, it is important to choose plants that are drought tolerant and lower in maintenance for a public space. Fruits and vegetables can be grown with little water in this arid climate, but it is necessary to choose the proper plants. In the long term, this can lessen maintenance and water costs, and can even decrease fertilizer use. In addition, working with a local nursery or seed supply company can assist in choosing drought tolerant varieties that are suited to the local environment, especially as more varieties are modified to be drought tolerant.

Currently, there are several tree and vegetable varieties that are more drought tolerant and suited to Poway's Mediterranean climate. Tree species include: fig*; goji berry; guava; jujube; loquat; macadamia; persimmon; and pomegranate; Vegetables include: bean varieties such as tepary; tomatoes; peppers; watermelon/squash varieties; corn; artichoke; okra; and dark star zucchini.

*figs can be invasive, both their roots and fruit seeds, so plant with care




SECTION 5: FUNDING and MAINTENANCE

Funding and maintenance can be major obstacles to many urban agriculture projects, and have been listed as a main barrier to food landscaping on public lands. Funding includes not only the cost of design and implementation, but also community outreach and staffing needs. Implementing these projects on public-owned park space can cut down on major costs associated with urban agriculture, including the purchasing of land and materials. Community gardens often face these barriers, as the plots can be located on privately owned land, and can require extra resources to design the site, including raised beds and fencing. On the other hand, food landscaping on public lands can decrease or eliminate these costs entirely.

Funding is also required for maintenance, which can come with its own set of barriers, including training and staffing. While public lands are already maintained, generally by contract companies, maintaining an edible landscape is different, and can require different approaches than what is expected for other street and shade trees favored by cities. This may require additional training, a new maintenance contract all together, or a strategic partnership formed with an outside nonprofit or community group that can assist with maintenance requirements. Public food landscaping may also require different maintenance considerations, such as reviewing and revising substances like fertilizers and pesticides that are used, which can be harmful to consume and for the environment.

City Highlight: Asheville's edible program has a three-pronged approach. The city has their own maintenance crew that focuses on the nonedible part of the landscape, including mowing the area. Secondly, they have a partnership with the nonprofit organization Bountiful Cities, which does edible maintenance through community workdays. Lastly, the city focuses on community engagement programs that teach the community how to maintain these spaces so that they can take over some of the work in the future. This is possible in part because the city only focuses on building up one food landscaping space at a time, building support and community maintenance for that space, and then progressing onto another project.

City Highlight: Vallejo, California established the country's first city-wide participatory budgeting program that allows community residents to vote on how to allocate tax revenue from the Measure B Sales Tax. In 2013, residents voted on allocating some of the funds to establish community gardens to grow food, beautify the area, educate children, introducing another way to fund these projects (City of Vallejo, n.d.)

Because funding is listed as a major barrier, it is important to consider other avenues for funding:

- Private donations, including both funds and landscaping materials
- Nonprofit organizations that can maintain the space for a discounted rate
- Grants, which can cover climate initiatives, educational programming, and water use
- Partnerships that can decrease funding concerns, addressed below

Poway:

There are various grants that exist for urban agriculture projects. These grants can be found in a variety of ways, including through the state, the federal government, and through private organizations. These funding opportunities can assist with a number of things, including water costs, training, and even funding if local students are brought into the project and taught valuable skills. These funding opportunities also emphasize the importance of having someone within the city who can focus on these and similar projects, and locate and apply for grants that can assist the city with building up their sustainability program. Currently, Poway does not have someone who applies for grants, which means the city is missing the opportunity to start these programs in a way that fits their budget and makes costs manageable.

Some Grant Opportunities for Poway:

- U.S. Department of Housing and Urban Development's (HUD) Community Development Block Grant
- U.S. Department of Agriculture's (USDA) Conservation Innovation Grants
- U.S. Department of Agriculture's Urban Agriculture and Innovative Production Grants

SECTION 6: PARTNERSHIPS

If funding remains a major barrier to initiating these programs, partnerships can serve to fill that gap, and have served important roles in similar projects. Partnerships can take a number of forms, and are based on the needs of the city and the community. While partnerships are important and perhaps even necessary for the implementation and continuation of food landscaping programs, they can at times be difficult to navigate. Some partnerships can be unreliable, and if a space depends on volunteer groups for maintenance, it is important to ensure that these groups are interested in these projects for the long term.

With publicly accessible food landscaping, one of the most important and common partnerships is with the community and residents. This can often lead to the creation of volunteer groups who take an active role in maintaining the space, including weeding and pruning. Often, these groups meet up on weekends and can serve as one way to increase community cohesion. Information for volunteers can be easily disseminated via social or print media, with word of mouth assisting in growing these events.

In addition to volunteer groups, nonprofit organizations serve an important role when developing food landscaping projects. There are various groups throughout the country that map fruit tree locations and glean the fruit when it is ripe, donating the produce to local food banks. In addition, some nonprofits take over all maintenance of the site, which can reduce city costs.

Lastly, private companies can be valuable partners in food landscaping. One city with an existing program referenced private companies as donating their time, money, and even land to incorporate into their program. In addition, local hospitals often donate to urban agriculture programs to assist in developing healthy eating habits, and nurseries can provide supplies and discounted plants.

City Highlight: Durand, Michigan's Beautification Project, which is in its second year, has had incredible community buy-in. This has led to partnerships with local community members that have helped the program progress and succeed. This includes community events that focus on maintaining the space, and even partnerships with private companies that dedicate yard space for these food landscaping projects. Community members have become so invested in this project that they supply the city with seedlings that they have grown, in addition to building materials.

Poway:

There are numerous school opportunities that can create local partnerships and provide an educational opportunity while also providing a funding strategy. By engaging local youth in these food landscaping projects, cities have the power to educate students on agriculture and landscape design while creating a volunteer group that can assist with maintenance and community outreach.

- 4H: 4H is an educational youth group that takes an agricultural focus while teaching students leadership skills through hands-on projects. This is an after-school program designed for kids aged 5-19. Projects can focus on veterinary science, farm animals, and gardening.

- FFA: Future Farmers of America is offered through Poway High School's Career and Technical Education department. Poway High School is the only school in Poway Unified School District that offers this pathway, and students take multiple classes throughout the program that count towards the Agriculture Pathway Completion, which is recognized by the California Department of Education as an indicator of college preparedness. This program could incorporate food landscaping in public parks as an important educational tool that focuses on localized food production, climate science, and community health.

In addition to school partnerships, Poway and San Diego County are home to a number of businesses and organizations that could provide partnerships for these programs. Nonprofit organizations include the San Diego Food System Alliance (SDFSA) and ProduceGood. SDFSA is focused on localized food systems that prioritize communities, and include sustainability, food justice, and educational opportunities. This organization partners with community members and private businesses, and could provide valuable insight into food landscaping projects in Poway. ProduceGood is one example of a local gleaning group that donates to food banks, and could be a valuable partner in maintaining these sites.

Other partners could also assist with funding and site development. The Miramar Landfill and Greenery site could provide compost and mulch supplies, in addition to local businesses like Kellogg Garden Products, which has been known to donate money and supplies to urban agriculture initiatives. Lastly, local churches may be an important group to partner with, and can provide valuable support for local community programs, in addition to having members who may be interested in volunteering for these programs.

Poway already relies heavily on volunteer groups for things like trail maintenance and a local garden area run by the Poway Garden Club. Poway has over 75 miles of trails, and the city has a trail committee that assists in the maintenance of these areas for public enjoyment. While there are some limitations that come with these volunteers, including an aging group, it shows that volunteers have been used successfully in Poway, and could continue to contribute in other ways.

SECTION 7: POLICY POTENTIAL

Implementing food landscaping on public lands introduces a number of policy potentials for local governments. This can include introducing language into a city's general plan, and can extend to multiple plan elements, including housing, city planning, or safety. Some cities are starting to draft Climate Action Plans (CAPs), which can include urban agriculture initiatives in addition to sustainability elements. These policy changes could lead to the requirement that food landscaping projects be included in future planning, considering all of the co-benefits these projects provide. This strategy can fulfill a number of purposes; by including food landscaping in a general plan, these projects can fulfill climate initiatives, health initiatives (e.g. reducing the urban heat island effect), and safety initiatives (e.g. reducing flood risk in parks by including bioswales). This language can also be included in future land use or open space plans, which can protect these projects from future change if they are introduced as city requirements.

Sample Plan Language Can:

- Prioritize edible plants over ornamentals when landscaping on public lands
- Consider food landscaping projects when developing new park spaces
- Introduce planning requirements that extend to new private developments
- Preserve open space within communities with an emphasis on producing food locally

In addition to sustainability plans and CAPs, many cities are also developing food action plans, which focus on everything from community food insecurities and expanding local farmers markets to supporting and increasing local food producers and access points.

City Highlight: Asheville, North Carolina established a Food Policy Action Plan in 2013, which included long term food goals like increasing support for community gardens and edible plantings on public land, which is upheld by the Parks and Recreation Department. Food policies also prioritize biodiversity and healthy ecosystems (City of Asheville, 2022).

City Highlight: Minneapolis, Minnesota is in the process of developing a Food Action Plan. Through this plan, the city hopes to develop a more climate resilient, just, and sustainable local food system and local food economy (City of Minneapolis, 2022).

While food landscaping might introduce potential policies that integrate these projects into future city planning, planning for these projects may also reveal language within zoning and land regulations that act as barriers. It is important during the planning phase to study language pertaining to how community members can interact with public spaces, including laws that ban people from taking from public lands. If similar language is included in local planning regulations, it will have to be altered and updated before projects can move forward.

City Highlight: Minneapolis, Minnesota has laws that prohibit individuals from removing objects from public parks, which is known as molesting vegetation. In order to achieve goals stated in the Urban Agriculture Activity Plan, which allows for urban agriculture to take place within the city's parks, the ordinance needed to be updated. Changes state that the provision against molesting vegetation does not apply to authorized persons and the general public who are accessing approved trees and plants (Minneapolis Park & Recreation Board, 2017).

Poway:

In the *Facility Rules and Regulations* document, which regulates how the community interacts with public spaces and parks in Poway, there is a law against disturbing plants and geological features, including removing any portion of a plant or tree. While this is necessary for preservation and conservation areas, such as the Blue Sky Ecological Reserve and the Ipai-Kumeyaay Center, this language can be altered so that it does not extend to marked food landscaping plants and areas, while still protecting the area's diverse native vegetation. As with the Minneapolis example given above, this change should only extend to trees and plants that have been incorporated onto public park space and land for food landscaping projects, and which are expressly marked for use. Currently, the regulation prohibits the removal, disturbance, or destruction of plants and geologic features. Instead, the regulation could be updated to include language that allows for people to interact with certain trees and plants, with the provision that this produce is not available for resale (City of Poway, n.d.).

CONCLUSION

Public parks are intrinsic to many cities in the United States. They have a long history of providing a community space for people, from passive enjoyment of the natural world to hiking, sports fields, and open spaces. As urban areas expand, many cities are incorporating parks and open spaces into city planning in order to retain these spaces for residents. These spaces provide communities with numerous benefits, but have the potential to provide even more, especially through the integration of food landscaping into public parks. The ecosystem and social benefits associated with these landscapes include an increase in air and water quality and the mitigation of future climate change effects while providing an additional space for community cohesion and education, in addition to producing food for public consumption.

These projects have the potential to provide so much more for community members, and will be incredibly important moving forward. It is important that cities begin implementation now rather than in the future. This guide will assist cities in considering the direction that these projects will take, and offers key insights into the planning process as these projects develop. It is important that cities look to the future rather than the present, and understand that moving forward, urban spaces will need to provide more services for its residents than have been included in the past.

GUIDE RESOURCES

Community Garden Guide/Survey Tools:

Marshfield Clinic (n.d.). *Growing together: Community Garden toolkit.* https://www.marshfieldclinic.org/Documents/garden-toolkit-2014-01-31-small.pdf

LaClair, B. (2016, July). *From farm to table: A Kansas guide to community food system assessment.* LaClair Consulting Services. https://www.publichealthlawcenter.org/sites/default/files/resources/KS-Food-Assessment-Guide-2016.pdf

Public Health Law Center. (2017, October). *Community Gardening policy reference guide.* https://publichealthlawcenter.org/sites/default/files/resources/Community-Gardening-Guide-2017.pdf

Edible Landscaping:

Oregon State University. *Edible landscaping.* Oregon State University Master Gardener. https://extension.oregonstate.edu/sites/default/files/documents/12281/ediblelandscaping.pdf

Poff, B. (n.d.). *Edible landscaping.* UC Cooperative Extension. https://sacmg.ucanr.edu/files/163567.pdf

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Poway 4-H. (n.d.). *About.* http://poway4h.com/

Gleaning Information:

Center for Agriculture and Food Systems. (n.d.). *Nationwide map of gleaning and food recovery organizations.* National Gleaning Project. https://nationalgleaningproject.org/gleaning-map/

San Diego Food System Alliance. (n.d.). *Gleaning in San Diego County.* https://www.sdfsa.org/gleaning

Policy and Funding:

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City of Portland. (n.d.). *Food policy and zoning in Portland*. https://www.portland.gov/bps/food-policy-and-zoning-portland

The City of Minneapolis. (2022, May 18). *Minneapolis food action plan.* https://www2.minneapolismn.gov/government/programs-initiatives/homegrown-minneapolis/minneapolis-food-action-plan/

U.S. Department of Agriculture. (n.d.). *Urban Agriculture and Innovative Production Grants.* https://www.usda.gov/topics/urban/grants

Southern California Planting:

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Appendix A: Poway Interview Guide

Thank you for setting aside some time to speak with me today. Before I get started with my interview, is it alright if I make an audio recording of this conversation? This recording is for transcription and research purposes. I am the only one who has access to this recording, and it will be deleted once I am finished with it. In any use of this research content throughout my report, your name will not be identified. You may request to stop the recording at any time or to erase any portion of your recording.

As I discussed in my email, I am conducting research for my capstone project for the Climate Science and Policy Master's program through the Scripps Institution of Oceanography. I am looking at the benefits and barriers to converting city-owned public greenspaces to food landscapes and having these spaces remain city managed. These spaces are separate from community gardens, and are designed to provide benefits for everyone in the community. I'm interviewing various city employees to gain insight into the implementation process for food landscapes, which will inform the creation of an implementation guide that can be used by city governments to aid them in converting existing greenspaces into multipurpose food landscapes that are open to the community. I am also interviewing various people who work for the City of Poway to learn more about how cities consider these projects and what might keep them from implementing these projects.

Do you have any questions before we begin the interview?

1. What is the stance of Poway in terms of planning and development on agriculture? Is it something that the city wants to promote? Conserve? Restore?
2. Is the City of Poway interested in implementing any type of food growing projects on city land, including public parks? Why or why not?
3. What are some of the barriers that Poway may face when implementing this type of project?
4. What are some of the benefits that these projects could provide to the community?
5. What types of information would help in initiating these projects or making them more accessible for the city?
6. Who would Poway need to work with to implement this project?

Appendix B: Existing Project Interview Guide

Thank you for setting aside some time to speak with me today. Before I get started with my interview, is it alright if I make an audio recording of this conversation? This recording is for transcription and research purposes. I am the only one who has access to this recording, and it will be deleted once I am finished with it. In any use of this research content throughout my report, your name will not be identified. You may request to stop the recording at any time or to erase any portion of your recording.

As I discussed in my email, I am conducting research for my capstone project for the Climate Science and Policy Master's program through the Scripps Institution of Oceanography. I am looking at the benefits and barriers to converting city-owned public greenspaces to food landscapes and having these spaces remain city managed. These spaces are separate from community gardens, and are designed to provide benefits for everyone in the community. I'm interviewing various city employees to gain insight into the implementation process for food landscapes, which will inform the creation of an implementation guide that can be used by city governments to aid them in converting existing greenspaces into multipurpose food landscapes that are open to the community. The program in [insert name] is similar to what I am proposing, so I'm hoping to learn more about how the city implemented this project.

Do you have any questions before we begin the interview?

1. Could you tell me a bit more about this project - how it began and what inspired it to happen?
2. Was this the first type of project that the city considered?
3. How does the community interact with this space? Are they allowed free access to the land and produce, or do volunteers manage the food production and distribution?
    a. Why is it this way?
4. What is the funding and management strategy for this project?
    a. And would this project have been possible without any grants or private/nonprofit partnerships?
5. What are some of the challenges or barriers that you have encountered with this project?
6. What are some of the benefits of this type of project that the city has seen?
7. What are some of the things that would have streamlined project implementation?