WOVEN SUBURBIA PROJECT: RETROFITTING SUBURBAN NEIGHBORHOODS WITH ECOLOGICAL, SOCIAL, AND AGRICULTURAL CORRIDORS

by

SHELBY MEYERS

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This thesis presents the landscape architecture design, Woven Suburbia Project. The Woven Suburbia Project implements ecological, social, and agricultural vegetation corridors into existing suburban neighborhoods. Corridors are composed of retrofitted individual residents' front yards and street edges, and are designed through the collaboration of a landscape architect and the suburban residents. Woven Suburbia Project responds to the rapid building methods of Post-World War II suburban development by implementing design elements that support community, local production, and environmental restoration. The design also takes inspiration from three contemporary design movements that work to bring ecological landscape systems into existing urban and suburban development. Ten steps to create a suburban corridor are outlined for a landscape architect to follow, so that this framework can be replicated for suburbs across the country. The redesign of La Costa Knolls, in San Diego, California will demonstrate how to execute the ten steps of the Woven Suburbia Project.

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Introduction

The sun rises over the glistening golden meadow grasses. A gray squirrel leaps from the meadow and onto the sheltering oak tree. It scuttles up the strong trunk to fill its cheeks with acorns, startling the mocking birds nested within. The birds cry their song that tells the neighbors that it is time to wake. The man in the white house is always the first person to stir the stillness along the street, for every summer morning he harvests fresh berries from his front yard for an early breakfast. The animal chatter and daily landscape changes make him proud of the vitality that has been brought into this suburban neighborhood. He recalls when his harvest included a fifteen-minute drive to the grocery store. Now, he gets to ponder the poppies, slowly meander with old friends, and delight in the moment when fresh peas can be snapped from the vine.

This picture of an ecologically, socially, and agriculturally vibrant neighborhood demonstrates a potential outcome from the Woven Suburbia Project. The foundation of this thesis will explore why and how the Woven Suburbia Project can help any suburban landscape to achieve the healthy ecological, social, and agricultural qualities of the countryside. First, this thesis will contextualize the Woven Suburbia through the exploration of Post-World War II suburban development. Secondly, it will explore three contemporary design movements that work to bring landscape systems into existing urban and suburban development. Next, it will outline ten steps that a landscape architect can take to design a Woven Suburbia Project. Lastly, this thesis will apply the Woven Suburbia Project to the suburb of La Costa Knolls, in San Diego, California.

The first portion of this thesis will show how after the Great Depression and World War II there were drastic societal changes that drove the population to make quick decisions about how to build America. People were hoping to see improvements for their country after the tragedies they had witnessed for two decades. This life was enlivened by intense economic growth, primarily created through urban and suburban growth and development. This portion of the thesis will demonstrate how the federal government approached this need for a radical change by creating policies to support the creation of millions of single family residential homes, centered around the new development of housing and infrastructure production techniques and the pent-up demand for housing.[1] Many other values that were previously respected in America, such as community and the environment became less important. As a result, the intentions for home-centric development drove the country toward intentions of profit and commodity, with the result of environmental degradation.

The second portion of this thesis will show how in the intervening years, the values of environment and community have grown more robust. Three contemporary design movements are currently working to bring community and nature into the hands of the public by introducing community design, the production of local resources, and the environmental restoration to the areas developed during post-war times.

The third portion of this thesis proposes Woven Suburbia Project as a means to introduce community design, the production of local resources, and environmental restoration into existing suburbs. For, the suburbs are a developed landscape that has

[1] Nicolaides, Becky M., and Andrew Wiese. "Postwar America." The Suburb Reader. New York: Routledge, 2006. 257-259. Print.

not been carefully researched and explored for retrofit and redevelopment by contemporary designers. To achieve the goals of the production of local resources and environmental restoration, the Woven Suburbia Project will focus on the introduction of productive social, ecological, and agricultural corridors to augment and enrich existing suburban yard and street space. To achieve the goal of community, the suburban redesign will follow a process that can help design the neighborhood with hands-on work from both the landscape architect and from the suburban residents.

The last portion of this thesis will illustrate the Woven Suburbia Project by applying it to La Costa Knolls, a small suburb located about 30 miles north of downtown San Diego, California. La Costa Knolls was built in 1985 during a time of sweeping development of single-family residential homes in San Diego County. The land which previously supported a hilly chaparral community alongside an oak woodland creek now supports 61 two-to-three-bedroom single-family homes with paved streets, concrete sidewalks, and grass lawns. There is no homeowner's association, community center, or parks. There is a hilly chaparral restoration area near the development, which offers an opportunity for connection between the suburban neighborhood and the native ecology. The application of the Woven Suburbia Project for La Costa Knolls will bring healthy social, ecological, and agricultural corridors to the neighborhood.

Part I. Post-WWII Suburban History

In his 1996 novel, *Holy Land: A Suburban Memoir,* D.J. Waldie poetically recollected his life in a suburban neighborhood.[2]

He notes:

"You leave the space between the houses uncrossed.

You rarely go across the street, which is forty feet wide.

You are grateful for the distance.

It is as if each house on your block stood on its own enchanted island,

Fifty feet wide by one hundred feet long.

People come and go from it, your parents mostly and your friends.

Your parents arrive like pilgrims.

But the island is remote. You occasionally hear the sounds of anger.

You almost never hear the sounds of love.

You hear, always at night, the shifting of the uprights, the sagging of ceiling joists,

And the unpredictable ticking of the gas heater." -271

One by one, the descriptions in this passage demonstrate missing links in many Post-World War II suburbs. Single-family homes have often become isolated and poorly built; nature has transformed into very wide streets and grass lawns; the daily

[2] Waldie, D. J. *Holy Land: A Suburban Memoir.* New York: W.W. Norton, 1996. Print.

community often consists of barking dogs, yelling voices, and the occasional passer-by. As demonstrated through D.J. Waldie's poetic dissatisfactions with the suburbs, there were many essential human needs that were explicitly forgotten in the development of millions of single-family suburban homes.

As noted by Dolores Hayden in her book, *Building Suburbia,* pre-WWII suburban life was based in the ideals of home, nature, and community, so that suburban life "encompassed both the private and public pleasures of peaceful, small-scale residential neighborhoods." However, Hayden illuminated how after the post-WWII economic expansion, "the residents' hope of unspoiled nature fails because open land vanishes with increased development," and "their hope of community is betrayed when tracts of houses, hyped as ideal 'communities,' lack social and economic centers, parks, schools, and necessary infrastructure."[3] Thus, 'home' is the only element of the triple dream that fits into the post war American lifestyle, because of how the production of a home and its economic benefit supports the American drive to boost the economy.

The Great Depression and World War II were societal triggers that influenced this sharp change in the progress of American suburbs, making the conditions noted by Waldie a suburban reality. As noted by Becky M. Nicolaides and Andrew Wiese in *The Suburb Reader*, in 'Postwar America: Suburban Apotheosis,' the depressed economy at the end of these two major events created a drive for the sad and war-ridden population to make a radical shift in its actions to create a healthy and vital home life. A radical

[3] Hayden, Dolores. *Building Suburbia: Green Fields and Urban Growth*, 1820-2000. New York: Pantheon, 2003. 8-9. Print.

economic, social, and political change needed to happen so to bring Americans back into a lifestyle that supported their twentieth century needs.

Nicolaides and Wiese explore how the federal government approached the need for a radical change by creating policies to increase the economy through the creation of millions of single family residential homes. These policies had a strong foundation because of the timely new development of housing and infrastructure production techniques and the pent-up demand for housing. This analysis demonstrates how the political drive that focused on the increased economy replaced the need for community, replaced local resources and quality for manufactured goods, and led to the building of millions of homes over abundant precious natural areas, causing devastating environmental degradation.

During the last years of WWII, the pent-up demand for housing was staggering; 1945 marked the sixteenth year in a row that new construction did not meet the demand for new housing. It was not uncommon for Americans to attempt to convert cars, chicken coops, and barns into family housing.[4] Nicolaides and Wiese note how the intensity of the housing need was due to the increasing economy, the returning war workers and veterans to urban areas, and the desire of veterans to settle down and start a family.[5]

There were many options that developers could have taken to satisfy this great need for housing, such as the development of multi-family homes, improvement of

[4] Hayden, Dolores. *Building Suburbia: Green Fields and Urban Growth*, 1820-2000. New York: Pantheon, 2003. 131-132. Print.
[5] Nicolaides, Becky M., and Andrew Wiese. "Postwar America." *The Suburb Reader*. New York: Routledge, 2006. 257-259. Print.

urban conditions to infill cities. Developers could have even designed with a greater likeness to community-and-nature-centric suburbs developed just 30-years earlier, such as Ebenezer Howard's Garden Cities[6], John Nolen's Mariemont[7], or Frederick Law Olmsted's Riverside[8]. However, internal economic and demographic pressures through lobbyists, politicians, and developers specifically supported a policy for the development of single-family suburban homes.[9] These policies offered no economic incentive for developers to build amenities for the sake of the community, such as parks, community centers, or natural areas.

Between the mid-1920s and the mid-1950s, five types of legislation were enacted to encourage the building of single-family home suburban real estate. These included: The Federal Housing Administration and Veterans Administration programs for mortgage loan insurance; homeowner mortgage interest deductions; interstate highway subsidies funded by gasoline taxes; and tax deductions for accelerated depreciation on commercial real estate.[10] These provisions of subsidies and changes on taxes allowed the government to focus their spending on private goods, as opposed to the more democratically oriented tactic of public spending. Thus, environmental and cultural considerations in the development of infrastructure, education, and transportation were overlooked, and the quick and efficient production of individual

[6] Howard, Ebenezer. *Garden Cities of Tomorrow*. London: Swan Sonnenschein, 1902. Print.
[7] Stephenson, R. Bruce. *John Nolen: Landscape Architect and City Planner*. Amherst: U of Massachusetts in Association with Library of American Landscape History, 2015. Print.
[8] Nicolaides, Becky M., and Andrew Wiese. "An Early 'Advertisement' for Riverside, Illinois, 1869'." *The Suburb Reader*. New York: Routledge, 2006. 24-25. Print.
[9] Hayden, Dolores. "The Importance of Older Suburbs." *Building Suburbia: Green Fields and Urban Growth*, 1820-2000. New York: Pantheon, 2003. 231-232. Print.
[10] Hayden, Dolores. "Building the American Way: Public Subsidy, Private Space." Unpublished Paper Delivered at the International Planning History Society Conference, Barcelona, Spain (2004)

homes was put on a pedestal. In other words, the government used the manipulation of the public's subsidies and taxes to make it in everybody's economic interest to focus on the consumption of home-centric products.[11] Hayden even considered the government's role as "a propaganda effort, a coalition of over seven thousand local growth machines composed of bankers, builders, and manufacturers supporting government aid to private real estate development as a national economic strategy to boost consumption."[12]

Thus, after the end of WWII the increase in single-family home development was staggering. "Whereas only 142,000 housing units were built nationwide in 1944, just two years later builders were hammering up over a million homes annually, 1.9 million by decade's end."[13]

The production of quick and cheap home development techniques supported the desires of the federal government to enhance private spending. Thus, taxes and subsidies were created to support technologies and machinery.[14] Factories were developed that could quickly manufacture building materials; advanced bulldozers were produced that could quickly level natural vegetation and topography to create flat lots. Dolores Hayden noted how, "Lumber companies had mastered mass production so that the scale of house-building was conceived in terms of tens of thousands of units, even

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[11] Ibid.
[12] Hayden, Dolores. "Mail-Order and Self-Built Suburbs." *Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 122. Print.
[13] Nicolaides, Becky M., and Andrew Wiese. "Postwar America." *The Suburb Reader*. New York: Routledge, 2006. 257. Print.
[14] Hayden, Dolores. "Mail-Order and Self-Built Suburbs." *Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 123. Print.

hundreds of thousands of units."[15] All parties found that it was highly profitable to create standardized homes with these techniques.

Because of the exiting new possibilities for a ready-made lifestyle, suburban Americans became very interested in having middle-class homes that were made with the latest models of products. Nicolaides and Wiese noted how, "Middle class status came to depend…on possessions and way of life—what a person consumed and how he behaved were more important than what he did for a living. In this milieu, suburban home ownership became an important badge of middle-class status. If you lived in a particular place, owned a home, and fit in, you were considered middle class."[16]

For example, an advertisement from 1950 for suburban homes in Tucson, Arizona appeals to the masses through a large headline proclaiming the deals on homes through GI Loans and no down payment. The advertisement then lists 22 specific home products that were all manufactured at a distant location from the homes, such as weather-stripped doors, asphalt tile floors throughout, electric exhaust fan, and cement front walk.[17] This advertisement's explicit mentioning of 22 household goods as encouragement for someone to purchase a home demonstrates the importance of owning a home with all of the latest household items.

Due to the mechanized process of post-war suburban development, untrained entrepreneurs such as bankers, builders, and brokers were able to take on a role as suburban land planners. As real estate historian Marc Weiss notes, a suburban land

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[15] Hayden, Dolores. "Mail-Order and Self-Built Suburbs." *Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 119. Print.
[16] Nicolaides, Becky M., and Andrew Wiese. "Postwar America." *The Suburb Reader*. New York: Routledge, 2006. 258. Print.
[17] Arizona Daily Star. Advertisement for Suburban Homes in Tuscon, Arizona 18 June 1950: 12A. Print.

developer, "designs, engineers, finances, develops, and sells an urban environment using as the primary material rural, undeveloped land."[18] These developers were not interested in designing a neighborhood for the qualities of a vibrant and natural community, but rather to create profit through the development of as much buildable land as possible.[19]

Thus, precious qualities such as topography, natural drainage, plant and animal ecologies, and soils were simply seen as barriers to the rapid development of single-family homes. As noted by Girling and Helphand in *Yards, Streets, Parks,* "Subdivision developers commonly stripped sites of all vegetation prior to grading and constructing roads. They filled marshes and culverted stream-ways in an effort to maximize buildable land. By the time residents moved in, all traces of the natural landscape were obliterated and replaced with roads, driveways, houses, and lawns."[20] Nature had mostly been replaced with natural abstractions of curved roads, pastoral rectangular lawns, and street names such as "Park," "Forest," "Hills," "Meadows."[21]

The subdivision of Levittown, built in 1949 by the Levitt brothers in Long Island, New York, exemplifies the post-war interest of creating profit-driven suburban developments. At that time, Levittown was the largest subdivision in America with 6,000 homes sprawled across miles of historical agricultural land. During Levittown's infancy, anxious homeowners were interested in settling down into a ready-made

[18] Marc A. Weiss, *The Rise of the Community Builders: The American Real Estate Industry and Urban Land Use Planning (*New York: Columbia University Press, 1987), I, 46-47
[19] Hayden, Dolores. "The Importance of Older Suburbs*." Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 231-232. Print.
[20] Girling, Cynthia L., and Kenneth I. Helphand. *Yard, Street, Park: The Design of Suburban Open Space*. New York: J. Wiley, 1994. 83. Print.
[21] Ibid.

neighborhood with all of the amenities of a quaint and family-oriented life. Girling and Helphand compared residents to "pioneers arrived en mass, much like the participants in a gold rush, finding a ready-made community to fulfill their desires for a home of their own and more."[22]

As noted by Dolores Hayden in her essay, "Building the American Way: Public Subsidy, Private Space," the standardized development of the Levittown homes streamlined the home-buying process, allowing buyers to quickly purchase a home, create a family, and begin to support the national economy through work. Every home was almost identical, with 800-square-feet designed with a living room, kitchen, two bedrooms, one bath, and a driveway. Sometimes the only notable variation was a picket fence versus a rail fence.[23] Alfred Levitt compared the process of standardized homes to the manufacturing of a car, where "each part will fit any house of the same model."[24] There was little need for the residents to make decisions in the creation of a home, for the intention of the time was to fit into the status-quo and follow the accepted patterns.

The Levitts did not consult topography, ecologies, existing uses, or community needs in their design, but rather saw the land as individual plots each worth a certain amount of money. In fact, the Levitt brothers did not look toward any methods of planning in their development of thousands of homes. They had no sewage disposal system, neighborhood council, education system, or place for commerce. Further, the

[22] Girling, Cynthia L., and Kenneth I. Helphand. *Yard, Street, Park: The Design of Suburban Open Space*. New York: J. Wiley, 1994. 95. Print.
[23] Hayden, Dolores. "Building the American Way: Public Subsidy, Private Space." Unpublished Paper Delivered at the International Planning History Society Conference, Barcelona, Spain (2004)
[24] Ibid.

massive road system was not integrated with the surrounding highways.[25] These systems and technologies could have realistically been planned into the environment, for they had been implemented and understood by the 1940s, demonstrating the Levitt brother's lack of interest in bringing nature or community into Levittown.

Other suburban developments that followed Levittown certainly included a few more principles of planning. However, design moves that related to community and nature were often removed from the plan so to decrease costs, whether by moving houses closer to the streets to save on piping, removing parks and planting strips, or combining sidewalks with curbs.[26]

Effects from government policy during Post-WWII suburban development are still working in America today. The creation of personal economic growth often overrides community growth. The creation of manufactured commodities often overrides local production. The devastation of natural landscapes is the consequence of these values.

It is imperative that new forms of urban and suburban development are considered so that America can house the ever-increasing population. Hayden notes, "there is no way Americans can create tens of millions of units of affordable housing without preserving existing places and supporting their ability to serve current residents as well as to absorb infill housing…. Where there are places with existing houses,

[25] Ibid.
[26] Ibid.

existing public infrastructure, and existing community networks (forged over years of propinquity), there are strong social reasons to rehabilitate as well."[27]

The next portion of this thesis will explore three contemporary design movements that are working with the existing fabric of urban and suburban areas to replace the individual needs of economic growth with community, manufactured commodities with local resources, and to restore a healthy ecological environment.

[27] Hayden, Dolores. "The Importance of Older Suburbs." *Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 234. Print.

Part II. Contemporary Design Movements

The following explorations of Food Not Lawns, Continuous Productive Urban Landscapes, and Green Infrastructure creates a bridge between the aforementioned Post-WWII private development values, and the design of the Suburban Corridor Project. Each of these three contemporary design movements retrofit the urban and suburban fabric of post-war development with ecological methods. Each of the three movements works at a different scale, from individual yards, all the way up to entire urban and suburban regions, creating unique solutions relative to their context. Each movement uniquely informs the Woven Suburbia Project.

Food Not Lawns

Food Not Lawns is an example of a neighborhood scale contemporary design movement that aims to improve existing urban and suburban developed areas, through an intimate community, the production of local resources, and environmental restoration. Food Not Lawns is a grassroots movement driven by the actions of the individual members of the community, that focuses on using lawns or other unused plots or corners in urban areas to grow food. H.C. Flores, author of *Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community*, notes how "Growing food is the first step toward a healthier, more self-reliant, and ultimately more ecologically sane life...when we take control [of food] back into our own hands, we empower ourselves toward autonomy, self-reliance, and true freedom."[28]

[28] Flores, H. C. *Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community*. 2. Print.

Founders of Food Not Lawns were inspired to provide knowledge and passion to the individual because of their observance of great flaws in contemporary American urban and suburban development. They noted how urban areas were designed for residents to move away from their communities through the use of cars, making people escape friends, families, and community-supportive jobs. Flores questions, "How do we begin to disconnect from the pressures and ugliness forced into our lives, and to reconnect, by choice, with the people, places, and things that give us joy?"[29] The founders quickly noticed how resource heavy grass lawns could be easily transformed into a garden for food production, in other words, a place to reconnect with the ecology of nature and the community.

The goal of Food Not Lawns is to inspire the individual to create an organic and productive garden, however and wherever it will grow. They believe that an individual's effort will ideally inspire another member of the community, ultimately creating a strong chain of individuals using their own hands to grow their own food. Flores believes that the only way to start the change is to begin within the local community and to spiral outward to greater populations.[30] Physically, this process can be as simple as giving away abundance from gardens, whether in the form of extra produce, seeds, shared labor, or knowledge. As opposed to the precedent of privately-driven development, Flores believes in a more egalitarian attitude of "embracing a role

[29] Flores, H. C. *Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community*. Forward. Print.
[30] Flores, H. C. "Ecological Design." *Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community*. 161. Print.

as willing participant, rather than master and commander, of the garden and surrounding ecology."[31]

The founders also saw Food Not Lawns as a method to step away from commodity driven lifestyles, through the production of ones' own goods. *Food Not Lawns* outlines hundreds of gardening, design, and storage methods so one can create their own food, medicine, and building materials, and support the greater ecology through clean air and water. The process of learning methods to produce one's own goods opposes the post-WWII commodity driven lifestyles, where factory production highly obscured the consumers understanding of the product.

Further, Food Not Lawns believes that the process of ecological restoration is driven by the personal production of goods. The creation of soil, planting of trees or crops, and harvesting and use of these goods highlight the healthy and unhealthy environmental consequences in the neighborhood and surrounding areas. Thus, the individual becomes educated about how to better treat the urban or suburban environment, and is then able to enact environmental changes, such as the elimination of pesticides, the planting of appropriate trees or shrubs, or the reduction of driving.

Food Not Lawns takes a subtle approach to relinking the community, resources, and ecology throughout urban and suburban areas. Although there is certainly power in how one individual can influence the actions of a community, the process of taking public action against the private-profit driven development process needs to have a more

[31] Ibid.

robust structure to make the kinds of change as desired by the founders of Food Not Lawns.

Continuous Productive Urban Landscapes

Continuous Productive Urban Landscapes, or CPULs, is an example of an urban-scale contemporary design movement that aims to improve existing urban and suburban developed areas, through an intimate community, the production of local resources, and environmental restoration. CPULs, created by Katrin Bohn and Andre Viljoen, promote the development of a coherently planned thread of open spaces that will connect the inner-city, through the suburbs, and out to the countryside. The thread will attach existing urban parks, gardens, forests, and other gathering spaces, to newly acquired land for urban agriculture. Bohn and Viljoen in their book, *CPULs: Continuous Productive Urban Landscapes* note how, "CPULs will read as parks or urban forests, green lungs or wilderness, axes of movement and journey, or places for reflection, cultural gathering and social play. They will be containers for an assembly of various activities that do not happen in buildings."[32] Most importantly, CPULs will be a place to grow food, so to cultivate community, local resources, and to ecologically restore unused urban spaces.

A primary goal of Continuous Productive Urban Landscapes is to make visible the productive resources required to support profit and commodity driven urban and suburban lifestyles. CPUL spaces will be designed to expose urban dwellers to "activities and processes traditionally associated with the productive countryside,

[32] Viljoen, André, Katrin Bohn, and J. Howe. *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities.* Oxford: Architectural, 2005. 11. Print.

thereby re-establishing a relationship between life and the processes required to support it."[33] These processes include the growing of food, the planting of diverse trees and water cleaning vegetation, and the management of land. From these activities of beautification and the creation of ecological biodiversity, services are created such as greenhouse gas reduction, improvement of water and air quality, noise filtering, the creation of a local food system, and a space for social activities and education.

Continuous Productive Urban Landscapes will perform a unique form of urban ecological restoration by interweaving urban agriculture throughout a city, without having to erase urban tissue or create a tabla rasa. Thus, CPULs will inevitably be inspired by and responsive to the existing fabric and culture of a city.[34] The designers who will obtain the land for CPUL plots will have to creatively reclaim greenfield or brownfield sites, un- or under-used plots or streets, parking lots, or any other roof or sidewalk that is not being used to its full potential. The renters or owners of the lot will then have the responsibility and choice to integrate the ecological function that best suits the site conditions, whether agriculture, park space, or native plantings.

The goal of CPULs is to integrate the organization and power of urban planning with the culture of the local communities. The movement has not yet created a clear procedure to follow to obtain the thread of land from the inner-city to the countryside, but ideally, the organization of urban planners, landscape architects, and other parks or

[33] Viljoen, André, Katrin Bohn, and J. Howe. *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities.* Oxford: Architectural, 2005. Definitions. Print.
[34] Ibid. 11.

landscape officials can work with eager individuals and communities so to obtain and manage the appropriate spaces.

Often, the designer focused approach to urban planning leaves out the local people and focuses on projects that support the status quo of profit-driven projects.[35] However, the design of CPULs recognizes the importance of offering "ownership and control to local people to manage their environments as they choose."[36] In general, local occupants will rent out the individual parcels of land and manage the production of food on the lot. As noted by Simon Michaels in "Urban Food Growing: New Landscapes, New Thinking", this process will allow for inventiveness and personalization in the city.[37] Interaction between plants, water, soil, animals, neighbors, and communities often found through the creation of spaces for urban agriculture, is hardly ever captured in development through traditional urban planning.

Continuous Productive Urban Landscapes takes a broad look at how a system for community driven agriculture and ecology can greatly enhance both urban and suburban areas. Bohn and Viljoen note how "suburbs offer generous open spaces, views to the horizon and access to sunlight, whereas city centers thrive due to a compact arrangement of cultural and social venues." CPULs work to create a threaded landscape

[35] Viljoen, "Sandwell: A Rich Country and Food for the Poor." *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities.* Oxford: Architectural, 2005.49-51. Print.
[36] Michaels, Simon. "Urban Food Growing: New Landscapes, New Thinking." *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities*. Oxford: Architectural, 2005. 218-220. Print.
[37] Ibid.

so that “suburban dwellers gain a pleasant walk to work,” and “city dwellers get a walk into the countryside, like a weekend escape.”[38]

Despite the authors’ desires to utilize the opportunities and constraints of both urban and suburban landscapes, their focus lies in the denser urban areas of a city, as opposed to the suburban areas. It does not seem like the concepts laid out for dense urban areas would thrive in the spread out and heavily privatized landscape of the suburbs.

Green Infrastructure

Green Infrastructure is an example of a landscape-scale contemporary design movement that aims to improve existing urban and suburban developed areas, through the production of local resources, environmental restoration, and community. The definition and scale of green infrastructure varies widely in contemporary planning, design, and restoration conversations, however, the intentions often hold the same value of introducing and conserving vegetated areas to deliver healthy urban services.

To define green infrastructure, it is important to clearly understand the role of existing urban infrastructure. Currently, urban infrastructure is primarily made of man-made and engineered elements to quickly transport elements such as water and sewage away from the city, as seen in the form of concrete gutters, sewers, pipes, and other devices.[39] Further, urban infrastructure is also made up of elements to quickly transport people, such as asphalt streets and concrete sidewalks. The goal of green infrastructure

[38] Viljoen, André, Katrin Bohn, and J. Howe. *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities.* Oxford: Architectural, 2005. 262. Print.
[39] "Green Infrastructure Training." American Rivers. American Rivers, n.d. Web.

is to replace some of these hard elements with vegetation that can filtrate, beautify, slow down, and diversify the ecology of urban and suburban areas within the city itself.

Thus, I bring together Webster's Dictionary definition of 'infrastructure' and the broad definition of Green Infrastructure in Tzoulas et al.s *Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review,*[40] to create a definition of Green Infrastructure for this thesis: All natural, semi-natural, and artificial networks of multifunctional, and multi-scalar ecological systems that create the substructure or underlying foundation for an urban or suburban area.

As noted by John W. Dover in *Green Infrastructure: Incorporating plants and enhancing biodiversity in buildings and urban environments*, the services of a green infrastructure will help to support the production of resources, without having to leave the city.[41] These services often come in the form of *supporting services*, nutrient and water cycling, soil formation, primary production; *regulating services*, climate control and pollution removal; *provisioning services*, food, medicines, building materials; and *cultural services*, societal appreciation of nature and environment.[42] The addition of these services will transform dense urban areas into environments with healthy, meditative, and transparent resource use.

Green Infrastructure restores natural ecological processes with various methods at multiple scales, including home, neighborhood, suburbs, dense urban area, and out to

[40]Tzoulas, Konstantinos, Kalevi Korpela, Stephen Venn, Vesa Yli-Pelkonen, Aleksandra Kaźmierczak, Jari Niemela, and Philip James. "Promoting Ecosystem and Human Health in Urban Areas Using Green Infrastructure: A Literature Review." Landscape and Urban Planning 81.3 (2007) Web.
[41] Dover, John W. *Green Infrastructure: Incorporating Plants and Enhancing Biodiversity in Buildings and Urban Environments*. Print.
[42] Ibid. 1

the city edges. As defined by Mark Benedict and Edward McMahon in *Green Infrastructure: Linking Landscape and Communities,* "at the parcel scale, green infrastructure means designing homes and business around green space, and include walking or nature trails... At the community level, green infrastructure could mean creating greenways to link existing public parks. At [the broader scale], it could mean protecting broad landscape linkages that connect forests, prairies, and other natural areas and provide habitat for animals."[43] At an even finer scale, Dover believes in the importance of the smallest scale elements of green infrastructure, such as green roofs, green walls, and street trees, to contribute to ecological urban services.[44]

For large-scale change to occur in an urban and suburban area, intensive top-down planning strategies are required. However, because of the nature of the intensive management necessary for vegetated infrastructure, it is important that all types of business, government, citizens, and nonprofit organizations are involved in the planning and management of these designs. Benedict and McMahon note how "Regardless of the scope of a green infrastructure initiative, success is achieved locally; successful leaders build broad stakeholder support through a consensual, open, fair, and transparent process."[45] Benedict and McMahon note how residents and other stakeholders should have the opportunity for input, feedback, and participation in the implementation of the green infrastructure network.[46] Because of the large and ever-changing scale of green

[43] Benedict, Mark A., and Edward McMahon. *Green Infrastructure: Linking Landscapes and Communities*. Washington, DC: Island, 2006. 14. Print.
[44] Dover, John W. *Green Infrastructure: Incorporating Plants and Enhancing Biodiversity in Buildings and Urban Environments*. Print.
[45] Benedict, Mark A., and Edward McMahon. *Green Infrastructure: Linking Landscapes and Communities*. Washington, DC: Island, 2006. 265. Print.
[46] Ibid. 231

infrastructure, there are endless opportunities for expertise from different types of experience and education.

Green infrastructure is the quilt which weaves together the various components of urban and suburban areas. It takes hundreds, if not thousands of people to collaborate to create a system that supports a healthy, clean, and functioning city. That said, it is a very broad vision that will never have a clearly defined beginning or end point. It is always in flux and will have to respond to unseen environmental, economic, and social factors as they come. I believe that the most effective way to build up to the goals of green infrastructure is to begin work at the community scale, with reference to the smallest and largest pieces that sit at the edges of that community. Designs at the community scale are more likely to make a visible impact, as the ecological, social, and infrastructural relationships can be traced and learned from, and then scaled up to meet the goals for an ecologically vital urban and suburban experience.

The analysis of the contemporary design movements of Food Not Lawns, CPULs, and Green Infrastructure demonstrates how there are some areas of the urban and suburban patchwork that are not addressed. Physically, the systems within the less-dense, single-family home suburban areas have not been widely addressed in these contemporary design movements. There are few formalized design methods about how to retrofit these areas into community driven, locally productive and environmentally healthy places. Socially, there are few systems that have collaborated simultaneously with the residents of the area and a designer such as a landscape architect, to envision and redesign a developed urban or suburban area. The physical form of the suburbs and the social relationship between residents and designer complement each other, for the

suburbs serve as an expansive canvas for individual residents to design their yards, and the landscape architect to weave these yards together.

As demonstrated through the Food Not Lawns movement, suburban areas often have un- or under-used land from front yards, that would serve as a perfect place to locally produce goods and improve ecological function. The front lawns also have great potential for social activation, as they are highly visible to all members of the neighborhood. As demonstrated through Continuous Productive Urban Landscapes, there is a great need to expose and physically connect the methods of production, especially that of food production, often associated with the countryside in urban and suburban areas. In a method that involves both the residents of an area and a designer, the creation of the physical connection will make corridors that are essential to reconnecting the ecological, social, and transportation tissue of development. As demonstrated through Green Infrastructure, there needs to be immense improvement in the entire ecological structure of development from the dense urban core all the way through to the outskirts of the suburban area. Many ecological design elements of urban water infrastructure, streets, and park space fitting into the framework of Green Infrastructure have been implemented in dense urban areas. Also, many conservation and restoration projects fitting into the framework of Green Infrastructure have taken place at the edge of cities in more natural areas. Fewer of these elements have been executed in between these two extremes in the less-dense, single family home suburban areas.

The next portion of this thesis will propose a new design process that fills these gaps, through a design process that will take place in the front yard and street space of suburban developments, with a system that works simultaneously with the residents of the area and a landscape architect.

Part III. Woven Suburbia Project

The premise of the Woven Suburbia Project stems from the need to bring vibrant communities, healthy ecologies, and locally produced goods into developed areas that are lacking in these amenities. Currently, there are approaches to bringing these qualities into denser urban areas. However, there are not many developed processes that successfully bring these qualities into less dense single-family home suburban areas. This design will focus on the suburban landscape that covers much of American soil. Because the foundation of the suburban landscape stems from the individual drive to own a plot of property, this design process will respect and utilize the individual's desire to manage their own plot of land. Further, due to the disparate open spaces created because of the individualized intentions of the suburbs, there will also be a landscape architect involved in the process so to insure that the individual management of plots all seamlessly fit together in an ecologically, agriculturally, and socially productive landscape.

Suburban landscapes have been defined in many different ways throughout their development. For this design, the precise understanding of a suburb is not crucial. The key element that needs to be present for the design process to work is to have a neighborhood with mostly single-family residential homes with un- or under-utilized front yard space. Further, it would be helpful if the neighborhood has a surplus of street space so that a portion of it could be re-developed for the creation of suburban corridors.

The ideal size for this form of suburban redesign should be from about 60-100 single-family homes. This size is intimate enough so that that landscape architect can

get a clear understanding of the culture, ecology, and resource use of the neighborhood. Further, this scale can realistically make visible the processes of production that are often associated with the countryside through the growth and sharing of food, the capturing, saving, and reuse of water, and the improvement of the soils. On the other hand, 60-100 single-family homes are large enough so that the work of the individual residents can be connected into a corridor of ecological and social processes.

The goal of this design project is to weave vibrant ecological, social, and agricultural corridors through small suburban neighborhoods. Characteristically, suburbs have a low-density and un- or under-utilized yard and street space, making them well suited places to insert ecologically abundant vegetation, socially vibrant meeting spaces, and agriculturally productive gardens. These corridors will help to promote spaces for the public through environmental restoration, community driven spaces, and the production of local resources. Ecological, social, and agricultural corridors are the most appropriate corridor types for suburban neighborhoods, for they help to counteract the private interests that were ever-present during much of suburban development that supported a profit and commodity driven society at the cost of environmental degradation.

A landscape architect should follow ten detailed steps to ensure that all of the essential processes are completed to create a healthy suburban neighborhood. The process of designing is not linear, and each of these steps should be interwoven and repeated when necessary. The organization of these steps responds to the hierarchy of scale of understanding from the broadest scale of design, down to the finest.

The ten steps are as follows:

1. Understand Greater Site Context and History
2. Understand Adjacent Social and Ecological Areas
3. Map and Analyze Social and Ecological Conditions of Site
4. Design Qualities of Social, Ecological, and Agricultural Corridors for Suburb
5. Provide Plant Palette for Corridor Typologies
6. Design Ecological Streetscape
7. Design Unique Regional Identities Within Suburb
8. Interview Residents in Neighborhood Region
9. Help Residents Design Front Yards
10. Educate Residents about Impact of Production on Resource Use

1. Understand Greater Site Context and History

Once a properly sized suburban neighborhood to redesign is chosen, landscape architect should work to thoroughly understand the general site context of the neighborhood. It is important to understand the greater ecology of the region. Especially note the intricacies of the region's water patterns, for every design decision such vegetation types, drainage, water capturing, and shelter, will depend on these weather patterns. This knowledge will ensure that the vegetation and creatures can thrive with the implemented infrastructures.

Further, the designer will also need to understand the social history of the region that led to the initial development of the suburb. As noted by Dolores Hayden in *Building Suburbia*,

> "Interpretation of the history of suburbs is a powerful tool to support reconstruction. Public history can convey the long ideological battle between the suburbs as places of aspiration and hard work and suburbs as places of segregation, stratification, special interests, and profiteering… Local history can help to define a positive sense of place in older suburbs by identifying important local victories and establishing landmarks, such as a crusading local newspaper or a volunteer nursery school. It can show the need for more democratic approaches to community development by revealing how hard residents have worked to create a sense of solidarity when places were new and raw."[47]

This history can help to elucidate when, why, and how the residents moved into the neighborhood, thus educating the landscape architect about how to approach the community in regard to retrofitting their neighborhood. It is important to note whether the residents seem open to this idea of change, for it is more appropriate to begin the process of retrofitting suburban neighborhoods with residents that are open to change. Once the movement has begun, it will be easier to demonstrate the positive effects to the skeptical suburban areas.

2. Understand Adjacent Social and Ecological Areas

Step 2 brings the designer to a finer scale of site understanding, by looking at the land uses adjacent to the suburb. At this scale, the landscape architect notes the adjacent site's drainage systems, soils, sun/shade, topography, ecological land covers, surrounding developments, proximities to stores, transportation systems, and open areas

[47] Hayden, Dolores. "The Importance of Older Suburbs." *Building Suburbia: Green Fields and Urban Growth, 1820-2000*. New York: Pantheon, 2003. 234. Print.

such as parks and recreation. The designer will map the opportunities and constraints for each of these qualities.

3. Map and Analyze Social and Ecological Conditions of Site

In Step 3, the designer will analyze the site of the suburban development of 60-100 homes. Here they will note the same qualities as in Step 2 including: drainage systems, soils, topography, ecological land covers, surrounding developments, proximities to stores, transportation systems, and open areas such as parks and recreation. It is crucial that the designer diagram and overlay each of these site conditions, to obtain a strong and clear understanding of the social and ecological conditions and relationships of the site. It is useful in this step for the designer to map the opportunities and constraints for each of these qualities.

4. Design Qualities of Ecological, Social, and Agricultural Corridors for Suburb

In Step 4, the landscape architect further analyzes the results of the site's opportunities and constraints and determines which type of social, ecological, or agricultural elements need to be woven into the corridors of yards and streets to connect the disjointed systems. For example, the designer may note how the ecological corridor is lacking clean water, leading the designer to consider water filtration through the use of stormwater plantings. The social corridor may be lacking areas for community gathering, leading the designer to consider turning yards into spaces for events. For the agricultural corridor, there may not be a store to buy groceries at a walking distance, leading the designer to implement local food growth on the site. Each suburb is inherently unique and complex, demonstrating the importance of having a landscape

architect to note and orchestrate all of the retrofit details. The designer should make a schematic diagram of how the elements needed fit together in the site's surplus space.

5. Provide Plant Palette for Corridor Typologies

In Step 5, the landscape architect more deeply identifies the needs of the ecological, social, and agricultural corridors through the designation of plant palettes for each typology. It is important that there are specific plant palettes for the neighborhood so that the plantings will thrive and provide health to the surrounding native ecologies, so that there is a continuous and maintained aesthetic throughout the neighborhood, and so that the residents can be educated about the natural ecological processes.

Joan Nassauer's article, "Messy Ecosystems, Orderly Frames" expands of the idea of the importance of a continuous and maintained aesthetic to the neighborhood. Nassauer notes, "People seek information about other people when they experience the landscape," so it is important to place, "unfamiliar and frequently undesirable forms inside familiar, attractive packages."[48] The clean aesthetic through a consistency of vegetation types will allow the ecological or agricultural plants to be vital and productive, while still appearing well kept. This will allow the neighbors to respect the amount of care taken in their other neighbor's yards.

Further, the types of plants chosen for the plant palettes will result in a certain education for the residents about natural ecological processes. For example, in specifically looking at the agricultural palette, the initial choices may consist of food plants that residents are very accustomed to eating, but are more than likely not

[48] Nassauer, Joan I. "Messy Ecosystems, Orderly Frames." Landscape Journal 14.2 (1995)

accustomed to growing. These plants may not serve the best purpose for the native ecologies around the site, for most popular crop plants are not native to most places in the United States. However, the process of the residents growing these crops will create a deeper understanding and relationship with these plants. And perhaps, with that understanding, people will be open to replacing their non-native crops with something more appropriate to the region.

6. Design Ecological Streetscape

Step 6 involves retrofitting the existing streetscape with uses that will support the ecological, social, and agricultural corridors. Many suburban streetscapes were designed with too much space for parking, no designed space for human interaction, and concrete storm drain infrastructure. The landscape architect should thoroughly map and diagram the existing streets of the suburb for its parking needs, water drainage systems, and relationship to social space. Consider the street's opportunities and constraints and design a corridor along the road that corresponds to the site's ecological, social, or agricultural needs.

7. Design Unique Regional Identities Within Suburb

Step 7 is a process that helps both the designer and the residents understand the unique elements built into the suburb. With an area of 60-100 homes there will inevitably be different social and ecological conditions throughout a site, whether influenced by microclimates, topography, relationships to ecologies, or proximities to entrances, cul-de-sacs, or gathering areas. Each condition will allow for differing relationships between the ways the residents interact.

In Step 7, the landscape architect divides the suburb into regions relative to their social and ecological conditions, and gives each of the regions a name relative to their conditions. This activity helps the resident to conceptualize where their home fits into the greater whole of the suburb, and it helps to create a common conversation about the most appropriate use of the designable space between neighbors.

8. Interview Residents in Neighborhood Region

Step 8 creates an intimacy between the landscape architect and the suburban residents. Once the landscape architect fully understands the site conditions of the whole site and the relationship between regions, it is important that they communicate their findings from their context mapping and analyses, to educate the resident about more obscure social and ecological qualities of their yard.

Simultaneously, it is important that the landscape architect ask the resident questions about their interests in ecological, social, or agricultural landscapes. The designer can ask whether they have an aesthetic preference, whether they have interest in spending time and energy on managing a yard, and whether they have any experience in managing an ecological space, a gathering space, or an agricultural space.

It is important to note that there will be a wide variety of interests and backgrounds in any suburban neighborhood. Thus, it is important that there are a variety of yard options that accommodate people with little to great interest in managing an agricultural, ecological, or social yard.

9. Help Residents Design Front Yards

In Step 9, the landscape architect works with the individual residents to design their yards, so that the yard meets the aesthetic and functional needs of the individual resident, and the needs of the greater ecological, agricultural, and social corridors.

10. Educate Residents about Impact of Production on Resource Use

In Step 10, the landscape architect educates the residents about the potential resource impacts of the productive systems that they have implemented, so that the residents' can learn about the nuances of water savings, local food production, ecological urban services, and other social, economic, and environmental processes.

Because of the rapid and profit-driven development of many suburban areas, many resources were depleted, unplanned for, or hidden by developers during their time of development. It is important that the landscape architect plans for methods to *expose* these hidden resources, so to reveal the processes that are often associated with the countryside.

Methods of education can be developed in a variety of forms including hands-on work with resource production, identification of ecological processes and changes throughout the suburb, quantification of water use, quantification of food grown in a given area, or the tracking of economic changes through the adaption of resource use.