

ABSTRACT

Title of Thesis:

THE CONTEMPORARY LOCAL MARKET:
CREATING A NETWORK OF FOOD
DISTRIBUTION

Eli W. Shanklin, Master of Architecture, 2017

Thesis Directed By:

Assistant Professor, Michele Lamprakos, School
of Architecture, Planning & Preservation

During the United Nations' 1996 World Food Summit, the concept of "food security" was defined as existing "when all people, at all times, have physical, [social] and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life". In the United States, the Department of Agriculture, measures food security on four levels—high, marginal, low and very low, with income and access as two of the major factors contributing to the problem of food *insecurity*. The country is dotted with hundreds, if not thousands, of food deserts—rural, suburban and urban census tracts—wherein the inhabitants do not have access to fresh fruit, vegetables, and other healthy whole foods. Today, 1 in 7 households, which equates to approximately 17.5 million households, are estimated to be food insecure. This thesis seeks to address the problem of food insecurity by creating a community-supported agricultural prototype in which nutritious foods are made accessible to an underprivileged neighborhood while debunking the beliefs surrounding the practices, processes, and sourcing associated with food production and distribution (e.g. "Farm to Shelf").

THE CONTEMPORARY LOCAL MARKET
Creating a Network of Food Distribution

by

Eli W. Shanklin

Thesis submitted to the Faculty of the Graduate School of the
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Advisory Committee:

Michele Lamprakos, Assistant Professor, Chair

Jana Vandergoot, Assistant Professor

Brian P. Kelly, AIA Professor

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Dedication

To my Savior, God, and King, Christ Jesus, who
has saved me and is the Keeper of my soul.
“The earth is the LORD’s, and everything in it, the world, and all who live in it.”
- Psalm 24:1

And to my mother, who continues to be a source of
joy, inspiration, and unconditional support in my life.
I love you.

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It takes a village—thank you all for being my village!

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Chapter 1: Background

Defining the Problem

The Food and Agriculture Organization of the United Nations (FAO) called the 1996 World Food Summit in response to the “continued existence of widespread undernutrition and growing concern about the capacity of agriculture to meet future food needs.” In 1974, governments attending the World Food Conference had proclaimed that “every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop their physical and mental faculties.”¹ In the United States, despite the prosperity the country has experienced, there remain numerous pockets of impoverished urban, suburban and rural areas that suffer from not being able to access the “inalienable right” to food, whether it is due to issues of proximity, income, or time. Measuring food insecurity entails observing all the previously stated factors within a given area about the size of a neighborhood—a census tract. For the purposes of this thesis, the factors of proximity, income, time, and availability will all be investigated.

A food desert is an area with limited access to affordable and nutritious food—to be exact, it is a socio-economic condition wherein households of a census tract do not have access to fresh and healthy whole foods within a mile of where they are located. To qualify as a “low-access community,” at least 500 people and/or at least 33% of the census tract’s population must reside more than 1 mile from a supermarket or large grocery store.² A census tract can exhibit some level of food insecurity, without being a food desert. The USDA has taken up the task of

¹ “World Food Summit 13-17 November 1996 Rome, Italy,” Food & Agriculture Organization of the United Nations, n.d., accessed January 2, 2017, http://www.fao.org/wfs/index_en.htm

² “USDA Defines Food Deserts,” American Nutrition Association, last modified 2015, accessed October 22, 2016, <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

categorizing levels of food insecurity, and the four levels that the USDA has come up with are: high food security, wherein there are no reported indications of food-access problems or limitations; marginal food security, wherein there are only one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house, and little or no indication of changes in diets or food intake; low food security (old label=Food insecurity without hunger), wherein there are reports of reduced quality, variety, or desirability of diet, and little or no indication of reduced food intake; and very low food security (old label=Food insecurity with hunger), wherein there are reports of multiple indications of disrupted eating patterns and reduced food intake.³ As an example, a typical component of a census tract with low or very low food security is the residents' dependence on corner stores and convenience shops for food, within a mile of their census tract. Not all food that is accessible is nutritious and even amid today's issue of food insecurity, having access to a typical supermarket can come with its own set of issues.

The Issue of the Supermarket

Industrialization made farming less labor intensive, meaning farming required fewer people to maintain farmland and harvest crops. Over the course of the past 200 years, the number of jobs that the agricultural industry provides has dwindled. In 1790, farmers made up 90% (3.5 million out of a population of 3,929,214) of the United States workforce. By 2000, the percentage of farmers in the workforce fell to 2.6% (7 million out of a population of 281,421,906).⁴ The Industrial Revolution transformed agricultural processes. Industrialization

³ "Ranges of Food Security and Food Insecurity," USDA Definitions of Food Security, last modified October 4, 2016, accessed October 24, 2016, <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security/>

⁴ "Historical Timeline—Farmers & the Land," Growing a Nation | The Story of American Agriculture, last modified 2014, accessed January 5, 2017, https://www.agclassroom.org/gan/timeline/farmers_land.htm

also shifted the concentration of job opportunities into more urban areas, and thus the geographic separation between agriculture and cities was set. Instead of consumers being served in large public markets by produce farmers, butchers, and other specialized and highly skilled food professionals, the 1900s' shift to the supermarket model of food distribution separated consumers from source. In fact, the distance between farms and the people served by them continues to be further obscured through the experience of the supermarket. Major grocery stores and supermarkets—for example, Giant Foods, Safeway, Walmart, and even Whole Foods Market—all rely on third-party distributors that manage and deliver the products made available for consumers, making both the grocery store and the distributor middlemen through which today's consumers must go through to know where their food is sourced from.

Waste from Farm to Supermarket



Figure 1: North American Food Losses at Each Step of the Supply Chain (image by author)
 [GP | Grain Products, SF | Seafood, F&V | Fruits & Vegetables, MT | Meat, MK | Milk]

Waste in Production (Farming):

In observing production losses (Figure 1), the Natural Resources Defense Council has determined that for fresh produce at the farm level, the greatest loss comes in two categories: 1) food that is never harvested, and 2) food that is lost between the harvest and the market. Produce can easily be harmed by pests, disease and weather patterns, but can also fall victim to economic factors. Low demand for a fruit or vegetable, labor shortages, and perception of food safety all play a role in production loss, as well.

“If market prices are too low at the time of harvest, growers may leave some crops in the field because they will not cover their costs after accounting for the costs of labor and transport. In addition, growers may plant more crops than there is demand for in the market to hedge against weather and pest pressure or speculate on high prices. This further lowers prices in bumper crop years, leading to more crops not warranting the cost of harvest. Called “walk-by’s”, as a consequence of both natural phenomena and market effects, entire fields of food may be left unharvested and plowed under. This is not a complete loss, as nutrients are returned to the soil. However, it still represents a lost opportunity to provide nutrition and not the highest use of the water, energy, and chemicals used to grow those crops.”⁵

Food safety scares also play a role in unharvested produce, regardless of whether the claims are founded or unfounded. As an example, in 2008, the USDA issued a warning regarding the presence of *salmonella* in tomatoes. Because of the warning, consumers, nationwide, obviously avoided tomatoes when shopping for food, even though the warning was eventually reported to be unfounded. The lowered demand for tomatoes led to tomatoes being left on the fields, instead of being harvested. In fact, “as a result, some 32% of total U.S. tomato acreage went unharvested,” during this time of low demand. It is estimated that about 7% of U.S. farmland typically goes unharvested every year. “Even fields that are harvested may have significant amounts of food left behind [because] workers are trained to selectively harvest....”⁶

Waste in Postharvest, Handling & Storage:

Culling—the process of removing products “based on quality or appearance criteria, including specifications for size, color, weight, blemish level,

⁵ Gunders, Dana, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” Natural Resources Defense Council (August 2012): 7, accessed December 18, 2016, <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>.

⁶ Dana Gunders, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” 7

and Brix (a measure of sugar content)”—is the primary cause for loss of fresh produce. In his book, *American Wasteland: How America Throws Away Nearly Half of Its Food (and What We Can Do About It)*, author Jonathan Bloom recounts situations of food waste postharvest. “A large tomato-packing house reported that in mid-season it can fill a dump truck with 22,000 pounds of discarded tomatoes every 40 minutes. And a packer of citrus, stone fruit, and grapes estimated that 20% to 50% of the produce he handles is unmarketable but perfectly edible.”⁷ This culled produce, called “off-grade” produce, is either sent directly to a landfill or used as animal feed on meat and dairy farms.⁸

Waste in Processing & Packaging:

“Processing facilities generate food losses mostly through trimming, when both edible portions (skin, fat, peels, end pieces) and inedible portions (bones, pits) are removed from food. Overproduction, product and packaging damage and technical malfunctions can also cause processing losses, though these may be difficult to avoid.”⁹

Waste in Distribution & Retail:

When dealing with perishable products that require consistent refrigeration, transportation and handling are critical components of the distribution process. Concerning retail, “in-store food losses in the United States

⁷ Bloom, Jonathan, *American Wasteland: How America Throws Away Nearly Half of Its Food (and What We Can Do About It)*. (DA Capo Press, 2010), 229.

⁸ Gunders, Dana, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” Natural Resources Defense Council (August 2012): 8, accessed December 18, 2016, <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>.

⁹ Gunders, Dana, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” Natural Resources Defense Council (August 2012): 9, accessed December 18, 2016, <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>.

totaled an estimated 43 billion pounds in 2008, equivalent to 10% of the total food supply at the retail level.”¹⁰ Most of the loss in retail operations is in perishables—baked goods, produce, meat, seafood, and, increasingly, ready-made foods, which makes sense. But, the tragedy comes in the mindset attached to that loss that many retailers have.

“The USDA estimates that supermarkets lose \$15 billion annually in unsold fruits and vegetables alone. Unfortunately, the retail model views waste as a part of doing business. According to a former President of Trader Joe’s, “the reality as a regional grocery manager is, if you see a store that has really low waste in its perishables, you are worried. If a store has low waste numbers, it can be a sign that they aren’t fully in stock and that the customer experience is suffering.”¹¹

Waste at the Consumer-Level:

Ultimately, it is with the consumer where food is wasted most. Lack of awareness, undervaluing food, confusion over labels (“best by”, “sell by”, or “use by”), and spoilage are the primary vehicles of food waste, and ultimately the major cause is our unfamiliarity with food and the country’s lacking food culture.¹²

Lacking Food Culture

More than any previous generation, contemporary consumers, are isolated from the reminders of how, where and when food is grown. Grocery stores essentially function as warehouses with display cases for food and offer no indications of the processes behind how our

¹⁰ Gunders, Dana, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” Natural Resources Defense Council (August 2012): 10, accessed December 18, 2016, <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>.

¹¹ Dana Gunders, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” 10

¹² Gunders, Dana, “Wasted: How America is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill,” Natural Resources Defense Council (August 2012): 12, accessed December 18, 2016, <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>.

food comes to be. Consumers are disconnected from farming practices and lack even fundamental knowledge of what producing good and healthy food requires. Both access to and knowledge of natural food should be considered “rights” given how significant they are. Instead, they have become privileges held by the farmer, the distributor, and the grocer. “Baby boomers, though they may not have had direct contact with farmers responsible for their food, might remember the days when fruits were available only seasonally, when milk could be delivered to their front doors, when eggs could be eaten raw in eggnogs, and steak tartar was a rare delicacy not a risky venture into foodborne illness.”¹³

In the book, *Omnivore’s Dilemma*, author Michael Pollan explores the complicated question faced by American grocery shoppers today— “What should we have for dinner?”. Pollan wrote that, in 2002, a major and country-wide shift took place in the collective eating habits of the country. The presence of bread as a staple of the American diet dwindled greatly, only to be replaced with an increase in the consumption of red meat. In 1997, a Senate Committee of the Carter administration issued a nation-wide set of dietary goals cautioning citizens to be wary of an over-consumption of red meat because of obesity, high cholesterol, heart problems, and myriad other health issues that could arise.

“But in 2002, an onslaught of diet books, [with Atkins as the ringleader,] scientific studies, and a New York Times Magazine article entitled “*What if Fat Doesn’t Make You Fat?*”—a story selling the idea that the fat from meat is nowhere near as unhealthy as we thought it was—the blamelessness of steak was restored, but the reputation of pasta and bread was dragged through the mud.”¹⁴

¹³ Denckla Cobb, Tanya, and Jason Houston, *Reclaiming our Food: How the Grassroots Food Movement is Changing the Way We Eat*. (North Adams, MA: Story Publishing, 2011), 40-47.

¹⁴ Pollan, Michael. *Omnivore's Dilemma*. (Penguin Press, Inc., 2006), 2.

After this, people developed what Pollan refers to as “carbophobia,” saying that severe changes in a nation’s eating behaviors are indicators of an innate gap in the collective knowledge of the country concerning food.

“Such indecisiveness would never have happened in a culture in possession of deeply rooted traditions surrounding food and eating. But then, such a culture would not feel the need for its most august legislative body to ever deliberate the nation’s “dietary goals”—or, for that matter, to wage political battle every few years over the precise design of an official government graphic called the “food pyramid.” A country with a stable food culture would not shell out millions for the quackery (or common sense) of a new diet book in January. It would not be susceptible to the pendulum swings of food scares or fads, to the apotheosis every few years of one newly discovered nutrient and the demonization of another....It would probably not eat a fifth of its meals in cars or feed fully a third of its children at a fast-food every day. And it surely would not be nearly as fat.”¹⁵

Pollan further argues that this unfamiliarity with food, ultimately due to our distance from the process of its production, has caused a nation-wide sense of anxiety regarding food, and that the supermarket of today complicates the decision-making process of choosing what to even eat. America lacks the collective food knowledge that would inform fundamental eating habits, and not having it certainly complicates the problem of choice. “As a relatively new nation drawn from many different immigrant populations, each with its own culture of food, Americans have never had a single, strong, stable culinary tradition to guide us.”¹⁶ In the United States, there is no long and consistent history of an evolving food culture; there were colonists and then many immigrants who had their own food cultures, which were added to the collective melting pot that is the United States. Despite the benefits of this melting pot, the country has been left “especially vulnerable to the blandishments of the food scientist and the marketer, for whom the omnivore’s dilemma is not so much a dilemma as an opportunity.”¹⁷ Just an example of the vulnerabilities

¹⁵ Pollan, Michael. *Omnivore's Dilemma*. (Penguin Press, Inc., 2006), 2.

¹⁶ Pollan, *Omnivore's Dilemma*, 2.

¹⁷ Pollan, *Omnivore's Dilemma*, 2.

we face is the numerous health and environmental problems created by our food system, which we owe to our attempts to oversimplify nature's complexities and obscure the infrastructure of agriculture. Many of the problems of health and nutrition we face today may be traced to the processes and practices taking place on farms, and behind those things stand specific government policies few of us know anything about."¹⁸ Because transparency in food production and sourcing is vital in creating food culture, one of the major concerns of this thesis is creating a venue through which consumers can foster a relationship with the people growing their food.

Reclaiming Our Food

The issues that underpin the lack of transparency in our relationship with food are more noticeable now than ever before, and reflect a lack of development in food culture. This thesis aims to design a community-centered urban agriculture prototype that creates a mutually beneficial relationship between food producers and food consumers, thereby establishing a local food culture. Inspired by numerous grassroots movements that have been initiated to give power back to the local farmers and inform people of the importance of food knowledge, this thesis calls attention to newer and more locally-supported food networks. The new food movement shifts away from the existing, rather expansive and inaccessible food system, and moving toward more inclusive, visible and accessible means of growing and sharing food.

“When it comes to food, this movement seems to have an especially powerful force. We are [beginning to move] away from anywhere-grown food, anonymous farmers, and opaque production and processing methods, toward more local and regional foods, farmers we can meet, farms we can visit, gardens we can grow. We are [beginning to move] away from highly processed, nutrient-poor foods with staggeringly long lists of unpronounceable ingredients, toward minimally processed, nutrient-rich foods with simple, known and trusted ingredients. In all types and sizes of communities—urban,

¹⁸ Pollan, Michael. *Omnivore's Dilemma*. (Penguin Press, Inc., 2006), 3.

suburban, and rural; rich, poor and middle-class; homogenous and diverse; old and young—we are rebuilding local food systems. We are reclaiming our food.”¹⁹

Built form has the power to affirm and reinforce existing ideas, but also inform and educate people on new ideas. Architecture will serve as a means of establishing a much-needed relationship between farmer and consumer within a community that wants and needs it. During a lecture sponsored by the TED 2016 conference, architect and co-founder of MASS Design Group, Michael Murphey, said, “Buildings are not simply expressive sculptures. They make visible our personal and our collective aspirations as a society.”²⁰ With these words in mind, this thesis proposes to design the *experience of food*—growing, gathering, and selling—at the neighborhood level, where food production and distribution have been demystified and the beneficiaries of that experience are full participants in a robust and viable food culture.

Chapter 2: Precedents

Studying major venues in which food is made available today will inform this thesis investigation on the successful traits of food production and distribution to be continued and the unsuccessful traits to be critiqued. This chapter will briefly review the following distribution typologies—the supermarket, the corner store (convenience store), the farmers’ market, the food co-op, the online food delivery service, and the community-supported agriculture (CSA) farm. The typologies will be reviewed on the following four categories: 1) food production (where the food is being sourced from), 2) the context of the typology (where the typology is stationed

¹⁹ Tanya Denckla Cobb and Jason Houston, *Reclaiming our Food: How the Grassroots Food Movement is Changing the Way We Eat* (North Adams, MA: Storey Publishing, 2011), 8.

²⁰ Murphy, Michael. “Architecture that's Built to Heal.” Lecture. February 2016. Accessed January 5, 2017. https://www.ted.com/talks/michael_murphy_architecture_that_s_built_to_heal#t-917351.

within its greater context), 3) proximity to the people being fed (whether or not the target consumer needs a car to access the typology), and 4) proximity to another like food source.

The American Supermarket/Grocery Store

There are approximately 38,015 supermarkets in the United States, which equates to about 1 supermarket for every 8,533 people.²¹ The typical supermarket ranges in square footage from 30,000 to 60,000, with the smaller companies like Aldi and Trader Joe's averaging 15,000 square feet.²² For the grocery store model, the Whole Foods Market at 2700 Wilson Blvd, Arlington, VA 22201—established within a more suburban context—will be studied.



Figure 2: Arlington, VA Whole Foods Market in Urban Context (image by author)

The chain prides itself on its connection with local farmers and claims a relatively straightforward distribution network. Along with the company's own small distribution centers,

²¹ "Supermarket Facts," Food Marketing Institute, last modified 2016, accessed January 11, 2017, <http://www.fmi.org/research-resources/supermarket-facts>.

²² Tom Ryan, "Are Smaller Stores a Big Opportunity for Supermarkets," Retail Wire, (May 2014), <http://www.retailwire.com/discussion/are-smaller-stores-a-big-opportunity-for-supermarkets/>.

the chain's primary distributor is United Natural Foods, Inc. (UNFI), co-founded by current co-CEO, John Mackey.²³ Whole Foods Market does not depend on a centralized or small number of farms. The company has a system of dispersed buying, wherein each vendor supplying Whole Foods is approved at the regional level for corporate standards. The suppliers' practices are reviewed (being non-GMO and Fair Trade are two major qualifications), and individual Whole Foods stores then decide which approved products to stock. The company has a rolling ten-year distribution arrangement with UNFI. UNFI has 17 U.S. and 4 Canada facilities, the closest distribution facility to DC being the York Distribution Center located along Cross Farm Lane in York, PA.²⁴ Whole Foods also has its own distribution branch, however partnering with UNFI connects Whole Foods with a much larger network of farmers, vendors and products.

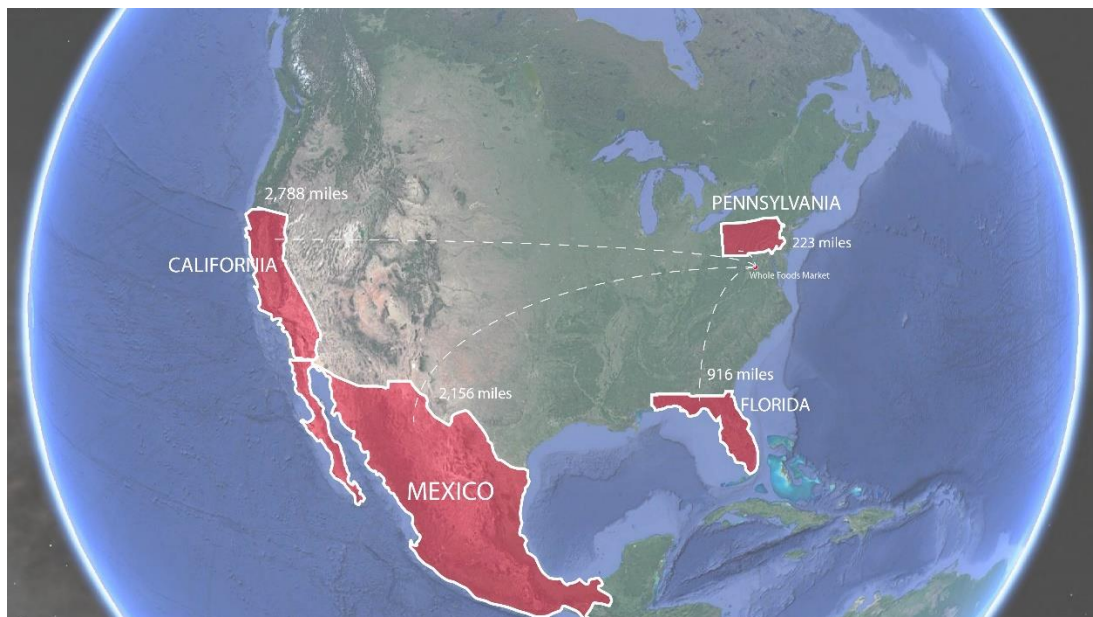


Figure 3: Whole Foods Market Produce, Meat & Dairy Sources (image by author)

²³ "Here's Why Shares of United Natural Foods Are Tanking," FORTUNE, last modified February 29, 2016, accessed October 21, 2016, <http://fortune.com/2016/02/29/united-natural-foods-shares/>.

²⁴ "UNFI Across the U.S. & Canada," UNFI United Natural Foods, n.d., accessed October 22, 2016, <https://www.unfi.com/locations>



Figure 4: Whole Foods Proximity to another Grocery Store (image by author)

The Corner Store (Convenience Shop)

The corner store, a type of convenience store, is a small, single-story shop meant to supplement the goods sold in supermarkets. Corner stores sell a very limited array of grocery items, processed snack foods, household goods, and over-the-counter drugs. There are over 150,000 convenience stores in the United States—1 for every 2,095 people. The average convenience store is just under 3,000 square feet.²⁵ Typically, these small shops are nestled within suburban and urban residential areas, and as the name suggests, are positioned at the corner of a block. Unfortunately, in many low-income urban areas across the United States, corner stores are the primary means of access to food. Washington, DC is a prime example of a city filled with corner stores. Division Market, Tony's Country Market, Nam's Market, 7-

²⁵ "Convenience Stores Sell Time," National Association of Convenience & Fuel Retailing, n.d., accessed January 3, 2017, <http://www.nacsonline.com/Research/FACTSHEETS/SCOPEOFINDUSTRY/Pages/Convenience.aspx>.

Eleven, A&S Grocery, Suburban Market, and a plethora of others are all dotted throughout the District, most heavily in Wards 7 and 8.

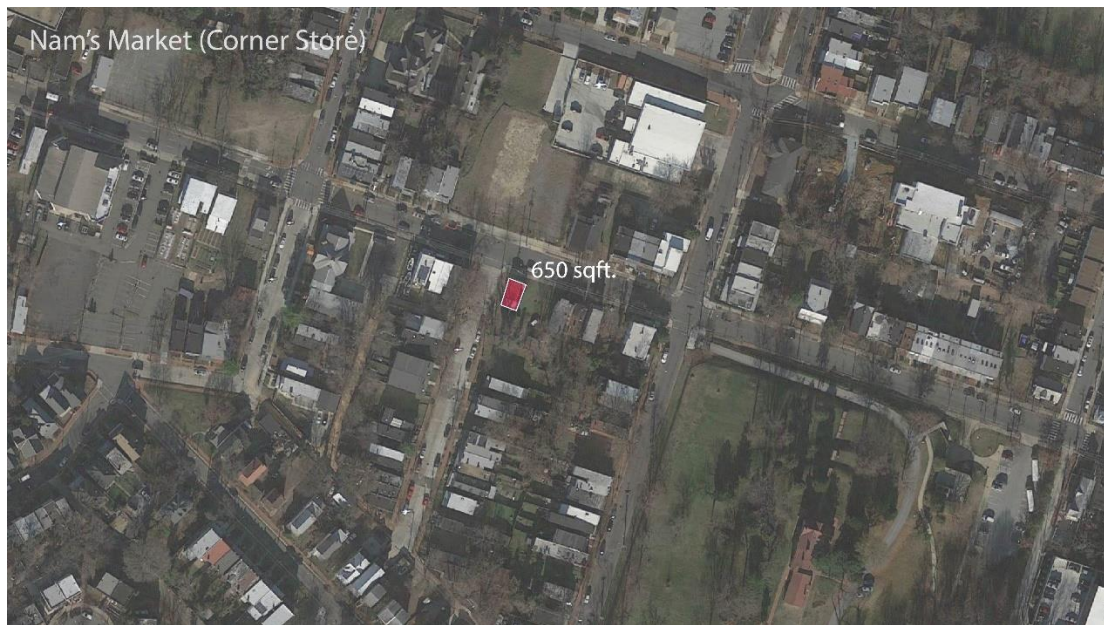


Figure 5: Nam's Market in Urban Context (image by author)

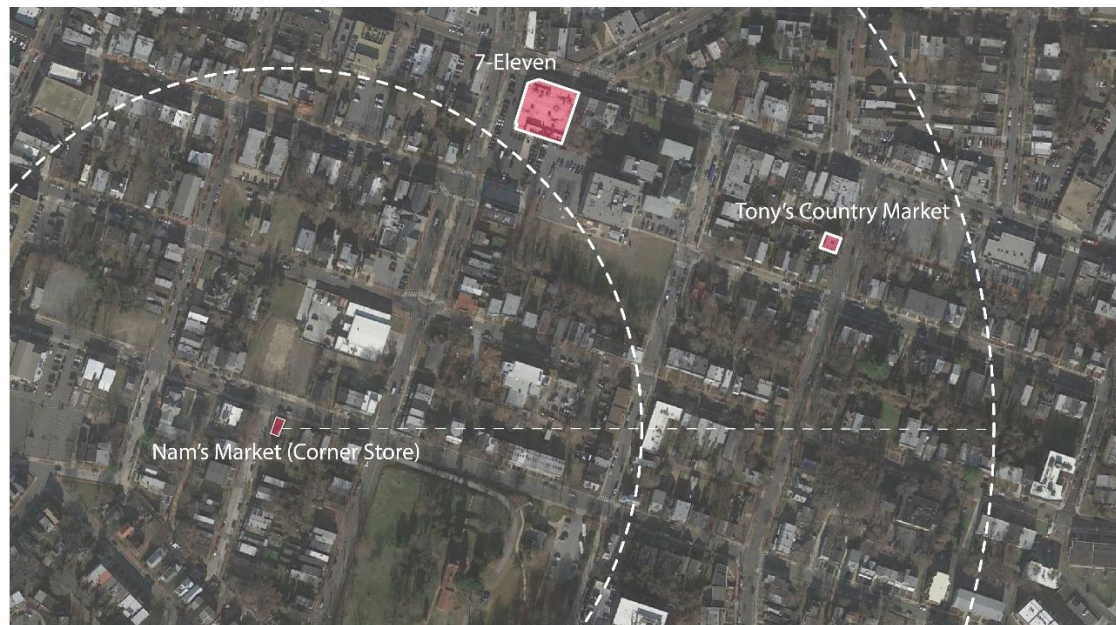


Figure 6: Nam's Market Proximity to another Corner Store (image by author)

There appears to be an inverse relationship between supermarkets and corner stores. To turn a profit and stay afloat, many of the items sold within corner stores are sold at a higher price because none of the items are sold in bulk and the selection is decidedly limited. Where there seem to be a sufficient number of healthy and diverse grocery stores, the solo and “mom-and-pop” corner stores are nowhere to be found because many of the grocery stores sell the same products, and often times for a cheaper price. The larger franchises and chains, like 7-Eleven, can flourish because of their relatively large selection of processed food and beverage items; they are more abundant than grocery stores within a given area, and many people simply enjoy snacking.

The Farmers’ Market

A farmers’ market is a public food market where farmers, bakers, and other food providers can sell their fruits, vegetables, meats and other products. Farmers’ markets are flexible in nature, in that they do not have to be confined inside of a building, but they are a recurring event, so these markets can be considered a dependable resource for people to obtain nutritious foods. “The number of farmers’ markets in the United States has grown rapidly in recent years, from just under 2,000 in 1994 to more than 8,600 markets currently registered in the USDA Farmers Market Directory.”²⁶

“Peak harvest season is usually peak market season, and some markets are only open in the spring, summer, and early autumn. In 2010, roughly 15% of all farmers’ markets were open in the winter months. Nevertheless, year-round farmers’ markets thrive in many states. Many markets are expanding their seasons or transitioning to year-round operation by offering their shoppers items including meat, eggs, dairy, bread and other products that are available fresh throughout the year. Even in colder climates, farmers are

²⁶ “About Farmers Markets (Q & A),” Farmers Market Coalition, n.d., accessed January 13, 2017, <https://farmersmarketcoalition.org/education/qanda/>.

implementing a variety of season-extending techniques that can protect crops from frosts and allow them to be picked and sold fresh for more weeks of the year.”²⁷

Though they may seem informal, farmers’ markets have operating guidelines that ensure the market consists primarily of farms selling directly to the public the products that the farmers have produced. To protect both the farmers and the consumers, some states have set up their own formal regulations that explain their desired market characteristics.

“[The products sold] at market depends on a combination of location, season, and market rules about what *can* be sold. Many farmers’ markets only carry locally-grown, locally-made and/or locally-processed, foods, and create a system of guidelines that ensure vendors are producing what they are selling. Farmers markets [...] give shoppers transparency while also protecting local farmers from having to compete with lost-cost, low-quality, often imported meat and produce.”²⁸

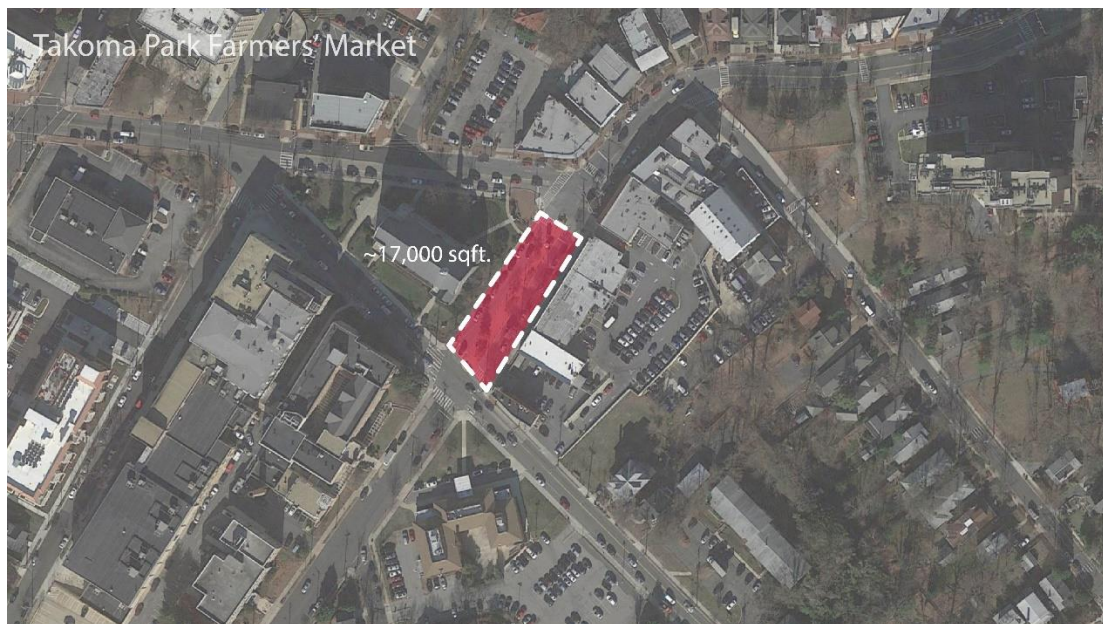


Figure 7: Takoma Park Farmers’ Market in Urban Context (image by author)

The farmers’ market that will be studied is the Takoma Park Famers’ Market (TPFM), located along Laurel Avenue in Takoma Park, MD. The TPFM operates year-round and is open

²⁷ “About Farmers Markets (Q & A),” Farmers Market Coalition, n.d., accessed January 13, 2017, <https://farmersmarketcoalition.org/education/qanda/>.

²⁸ “About Farmers Markets (Q & A),” Farmers Market Coalition.

on Sundays from 10 am to 2 pm.²⁹ The market currently has 24 vendors registered for 2017, selling a large variety of fruits and vegetables, baked goods, dairy items, herbs and flowers, fresh and cured meats, jams, and more. Both free and metered street parking is available behind the Takoma Park Seventh-Day Adventist Church, across Eastern Avenue from where the market is held, within about a half-block. The farmers' market is also 4 blocks away from the Metro's red line Takoma Park Station, and is accessible via Metro bus as well as Capitol Bikeshare.



Figure 8: Takoma Park Farmers' Proximity to another Farmers' Market (image by author)

The Food Cooperative (Food Co-op)

A food or grocery co-op is a self-governing association of people that have voluntarily come together to provide for themselves, and others, the food they believe should be accessible, through a jointly-owned and democratically-controlled enterprise.³⁰ Within the framework of the

²⁹ "Hours & Location," Takoma Park Farmers Market, last modified 2014, accessed January 10, 2017, <http://takomaparkmarket.com/hours-locations/>.

³⁰ "What is a Co-op?", Neighboring Food Co-op Association, n.d., accessed January 10, 2017, <http://nfca.coop/definition>.

association, the people are the ones who own and operate the building being used, the people choose which farms they source their food from, the people work with the farmers and suppliers whose products they will sell, the people are the ones in control. Food co-ops typically offer only natural and organic foods. A person does not have to be a member of a co-op to purchase food, but anyone who wants to invest, can become a shareholder. There are seven universal principles that govern all U.S. food co-ops, which ensure equality for all existing and potential shareholders.³¹

The food cooperative that will be studied is the Takoma Park Silver Spring Co-Op (TPSS) located at 201 Ethan Allen Avenue, Takoma Park, MD 20912. TPSS has an executive board of 8 volunteer members, most of whom have term limits, and the shareholders participate in voting in the board members. TPSS has more than 77 local vendors that supply their store, some of which are not farmers, but specialty shops that provide items like organic sushi, vegan sandwiches, kombucha, and high-quality sausages.

The Online-Based Food Delivery System

The food delivery service that will be studied is Hungry Harvest, a small non-profit company started by University of Maryland graduate Evan Lutz in 2014. The mission is to combat hunger and reduce food waste simultaneously, and so Hungry Harvest sources, recovers, and delivers boxes of farm-fresh produce to registered customers on a weekly and bi-weekly basis. The smallest boxes of recovered produce offered by Hungry Harvest are \$15.00 and provide 5 to 7.5 pounds of produce—1 leafy green, 3 to 4 types of vegetables and 2 to 3 types of fruit. The produce can easily last 7 to 10 days, depending on how one prepares the food. For

³¹ “What is a Co-op?”, Neighboring Food Co-op Association, n.d., accessed January 10, 2017, <http://nfca.coop/definition>.

every delivery, the company donates 1 to 2 pounds of produce to one of their donation partners or through a free farmer's market.³² For those not receiving donations from Hungry Harvest, a subscription is required to receive food. A subscriber is only paying a single fee per box they order, and they can unsubscribe whenever they choose.

“Recovered” food is produce that would be thrown away, composted or given away as feed to a meat or dairy farm—grocery retailers would consider this food to be off-grade. The produce is purchased at a discounted price, due to it being below the market standard for superficial reasons, and is transported from the 14 farms that Hungry Harvest has partnered with. After arriving at the *Coosemans DC* storage and distribution warehouse at the Maryland Produce Market in Jessup, MD (also rented space), the items are checked, washed and packaged into boxes. The produce is then distributed to Hungry Harvest subscribers. Hungry Harvest currently rents space out of City Garage in Baltimore, MD, which serves as the headquarters for the non-profit.³³

The Community-Supported Agriculture (CSA) Farm

At the heart of the CSA model is the drive to support local farmers by becoming partners with them and investing in their efforts and crop. In a CSA, consumers pay in advance for a year’s worth of food, sharing the costs and risks of the agricultural process. In return, these investors get fresher food, avoid the middleman distributors and chains that often times do not provide information about the products’ origins, and ultimately keep good farms, no matter how small, operating. Small farms, today, have to compete with large-scale productions that have the

³² “Frequently Asked Questions,” Hungry Harvest, n.d., accessed October 14, 2016, <http://www.hungryharvest.net/general-questions>.

³³ Kevin Kresloff, e-mail message to author, January 5, 2017.

financial means and professional network necessary to provide mass quantities of produce, meat, and other products. The farmer, who then has a tangible connection with the people s/he is serving, can grow without having to fret about how generous the regional, national or global market will be for a particular year. Any surplus crop yields can either go to the investing consumers or be donated, and during the years where crop yields are lower than expected, the community of investors along with the farmer(s) can reassess practices for the upcoming growing season.

The CSA organization being studied is Common Good City Farm (CGCF), a community urban farm located just south of Howard University in NW Washington, DC, between V Street and Elm Street (V St NW, Washington, DC 20001). Currently, CGCF operates on a seasonal basis, but they are considering growing during the winter months. Though the farm primarily grows vegetables, there are a few fruit trees and berry bushes on the premises. One does not need to be a CSA member to purchase food from the farm, but members are guaranteed to receive food. There are currently 20 memberships for the CSA, but the food could be going to a single person or large family. Members are provided 10 to 20 lbs. of fresh produce every week. There is a weekly market Farm Stand Program where non-members can purchase whatever they like.



Figure 9: Common Good City Farm (image by author)

Processing and packaging happens onsite. Typically, the farm produces around 5,000 lbs. of food per year, but in 2016, 7,000 lbs. of food were provided to those who shop at CGCF. When there is a surplus of food, CGCF can provide more food to its CSA members, donate more food through their Green Tomorrows Program, and sell more food to non-members and restaurants through other programs the farm offers. During the lower-yielding years, they obviously have less food to allocate to different programs; providing for the people that are paying to support the farm through the CSA is a major priority, though.

Of the precedent studies, the urban farm and CSA, Common Good City Farm, the Takoma Park Silver Spring Food Co-op, the mobile market, Fresh Moves, as well as the customer-delivery model of Hungry Harvest, provide examples of program that are necessary for meeting the goals of this thesis. At the core of the CSA and urban farm frameworks lies

community investment into one or more farms and empowerment of the community to take some level of food production into their own hands.

Chapter 3: Site Analysis

What makes a “good” site for this thesis?

Beneficial site characteristics for this thesis investigation are: 1) location within a food insecure census tract—no access to fresh fruits or vegetables within a mile of the site, while still being accessible to urban and suburban neighborhoods; 2) having public transportation infrastructure, like Metro rail, buses, and Bikeshare stations, so that the proposed project does not exist as an object floating in a swath of sprawled suburbia; and 3) being located within a proximity of 400 miles to farms (this will mean that all of the food sourced within that radius can be deemed “locally-sourced”), as defined by the *2008 Consolidated Farm and Rural Development Act*.³⁴

With the previously mentioned factors in mind, using digital resources provided by the United States Department of Agriculture (USDA), a map with up-to-date locations of food insecure areas nationwide is being used to determine a viable location for investigation. The USDA Food Access Research Atlas (FARA), also known as the USDA Food Desert Locator, is a digital resource that maps census tracts—areas roughly equivalent to the size of a neighborhood—of people that the USDA’s Economic Research Services (ERS) measures as being low-income *and* not having access to healthy whole foods, two major factors in measuring food insecurity. The USDA ERS, within every census tract it investigates, reports a certain number of households that are outside a 1-mile radius from a supermarket or venue that

³⁴ US Department of Agriculture. “Report on the Definition of “Rural”.” Rural Development (February 2013): 8.

consistently sells fresh whole foods (fruits and vegetables) for urban tracts and outside a 10-mile radius for rural locations. The ratio of houses that *are* within a 1 or 10-mile radius from a supermarket and *are not* within a certain radius from a supermarket or other whole foods providers is displayed as a percentage. The food insecure census tracts in question are clustered together and located within the NE quadrant of DC and also along the border between the District and southern Prince George’s County, MD—Census Tracts 11001011100 (354 of 1,727 total households—20.5%), 11001009601 (244 of 786 total households—31%), 11001007806 (330 of 964 total households—34.2%), 11001007809 (609 of 1,135 total households—53.6%).³⁵ The most alarming number is the final census tract mentioned, Tract 11001007809, which is within Ward 7’s Deanwood neighborhood of NE Washington, DC. This tract sits along the border between the District and Prince George’s County, MD, right across Eastern Avenue.

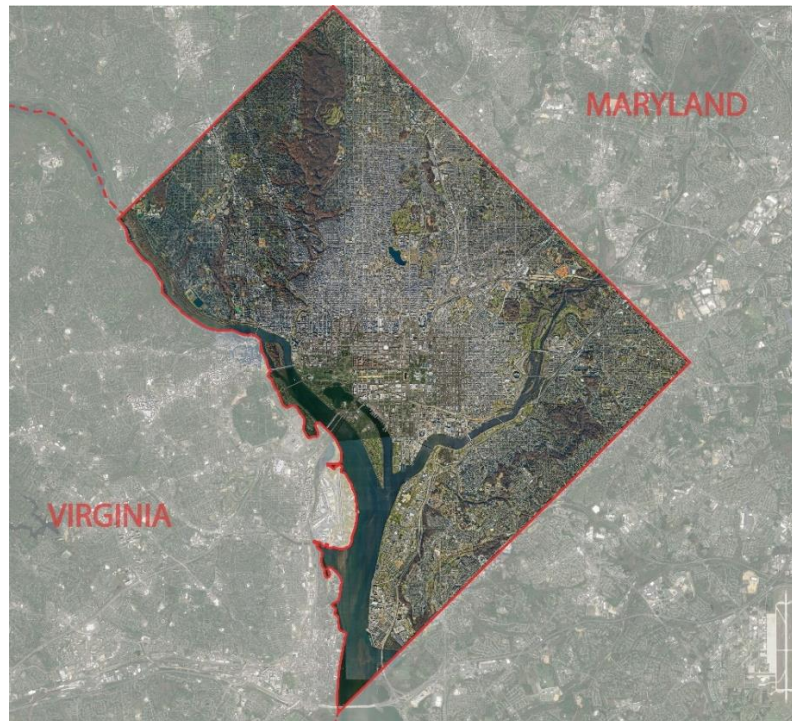


Figure 10: Washington, DC (image by author)

³⁵ USDA Economic Research Service, “Go to the Atlas,” Food Access Research Atlas, last modified November 17, 2016, accessed October 20, 2016, <https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/>

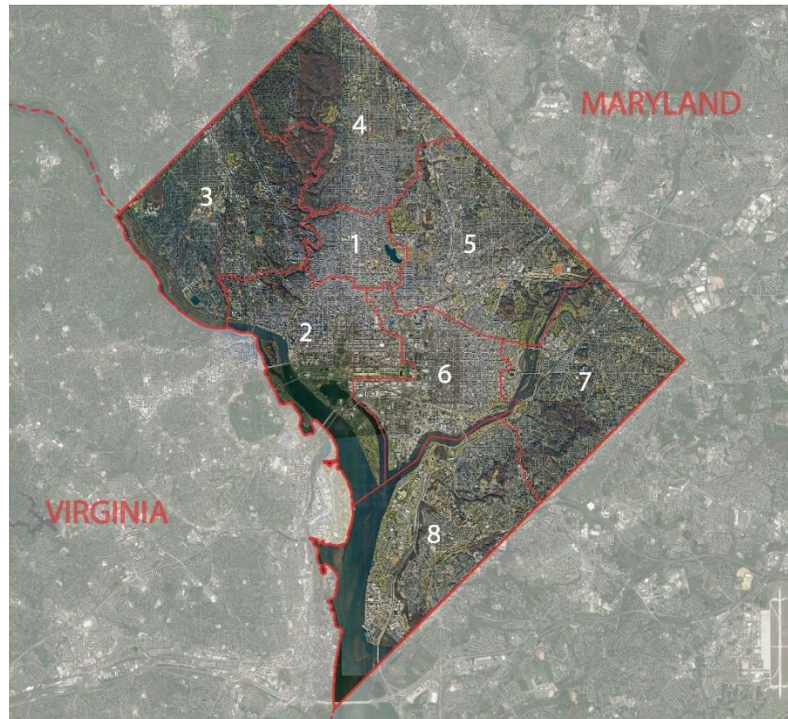


Figure 11: Wards of Washington, DC (image by author)

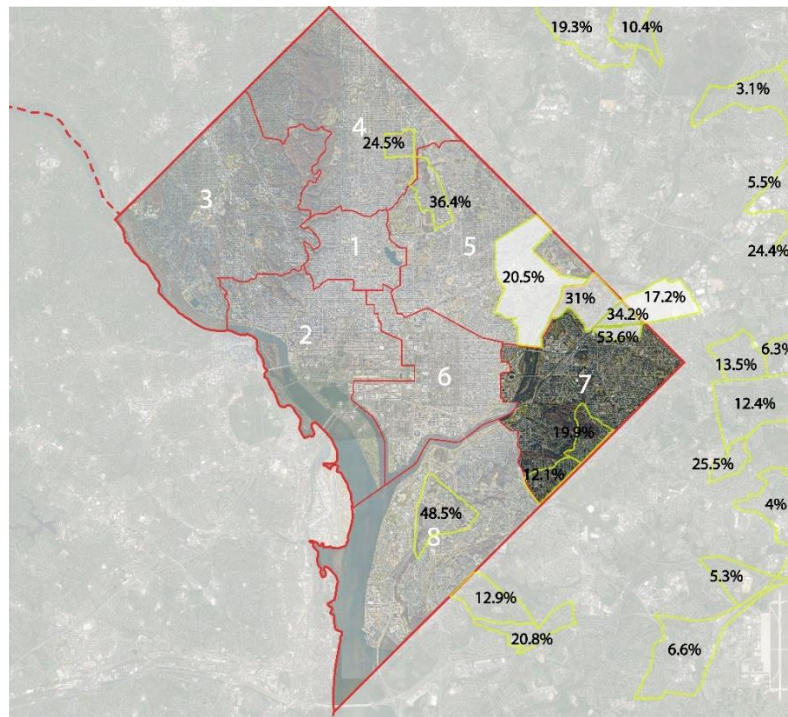


Figure 12: Food Insecure Census Tracts in Relation to Washington, DC (image by author)

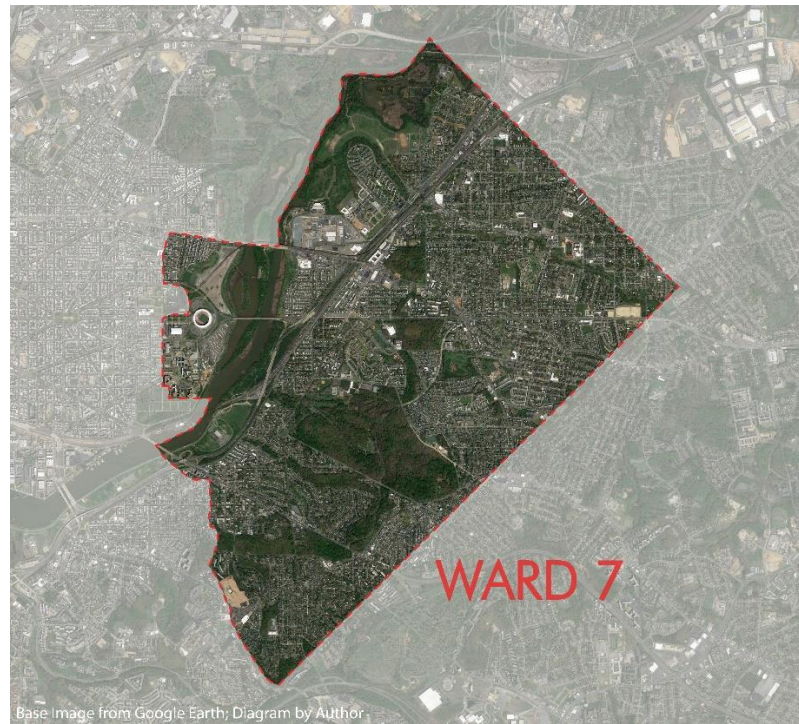


Figure 13: Washington, DC – Ward 7 (image by author)

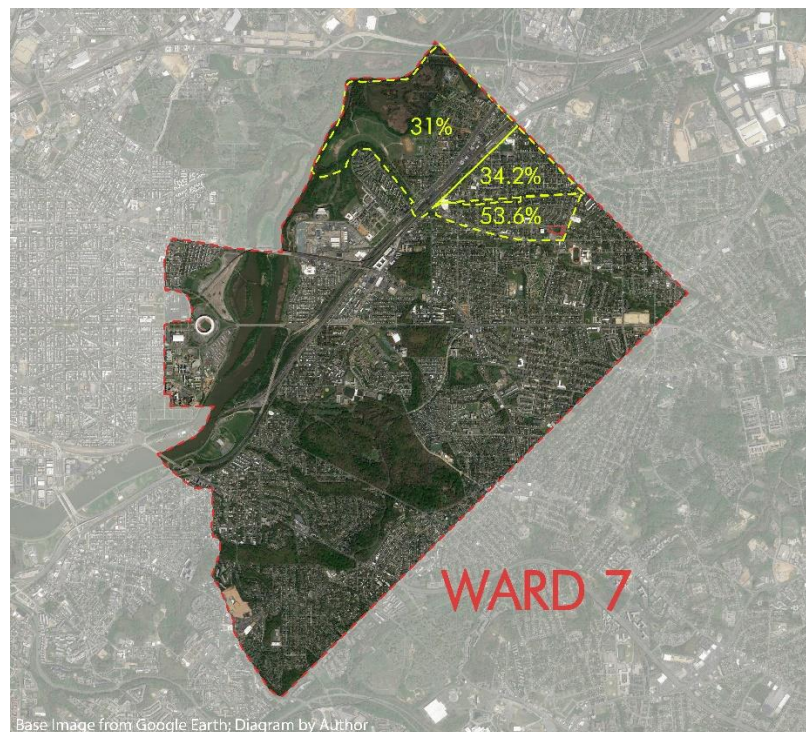


Figure 14: Food Insecure Census Tracts Ward 7 (image by author)

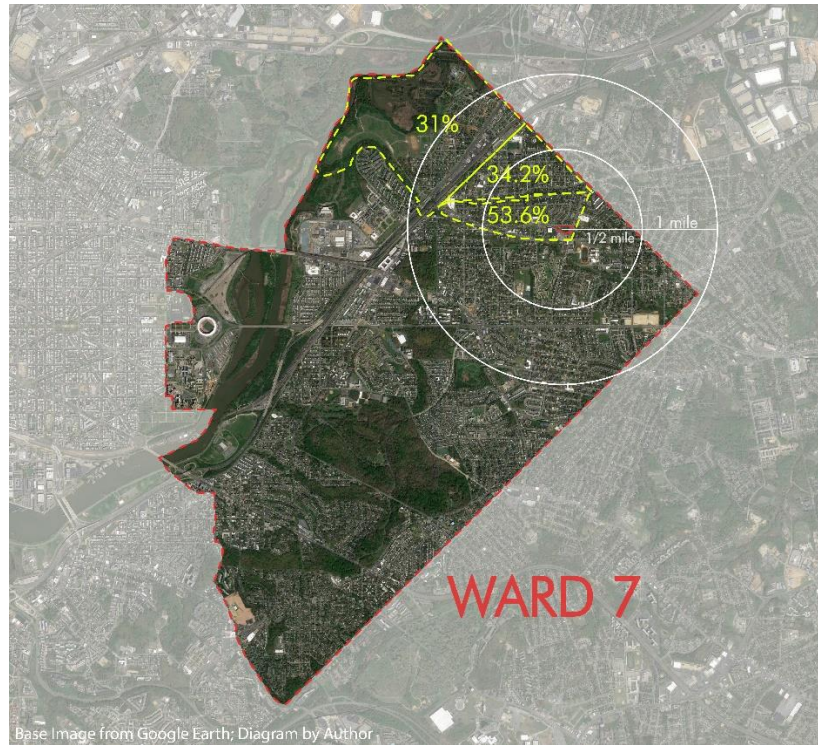


Figure 15: 1/2-Mile and 1-Mile Reach of the Site (image by author)

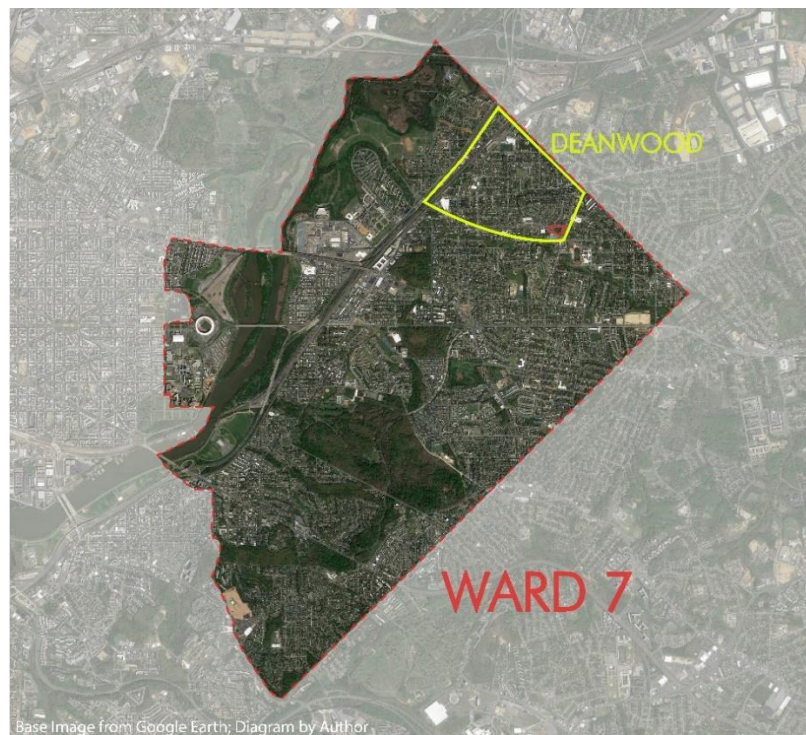


Figure 16: Site within Deanwood Neighborhood (image by author)

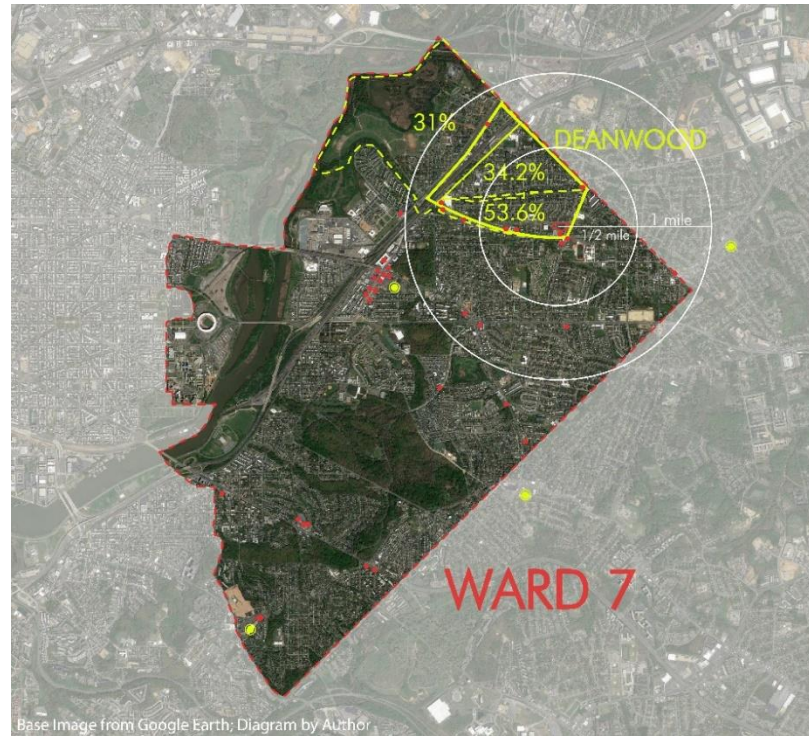


Figure 17: Convenience Stores, Corner Stores & Carry-Outs [red dots] v. Supermarkets [yellow dots] (image by author)

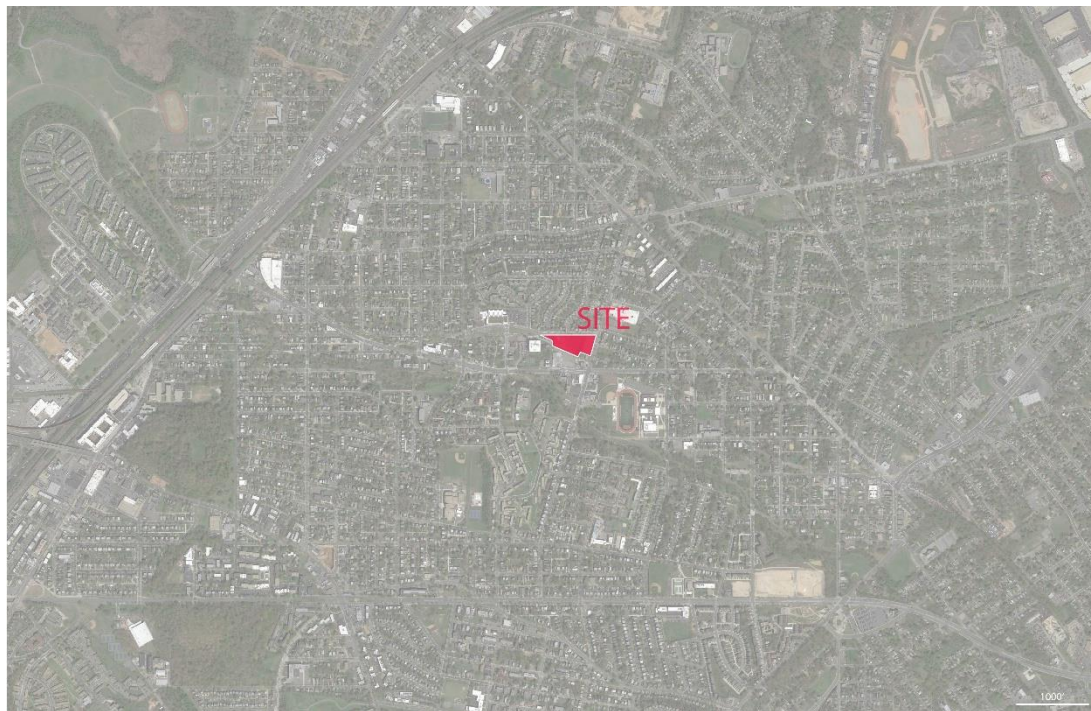


Figure 18: Site in Context – Zoom 1 (image by author)

Thesis Site / 5201 Hayes Street + 712 Division Avenue—Deanwood Neighborhood

The site on which the proposed Food Hub will exist includes 5201 Hayes Street, NE Washington, DC 20019 (93,540 ft²) and the adjacent lot of 712 Division Avenue, NE Washington, DC 20019 (37,323 ft²). It is located at the southeastern edge of the Deanwood neighborhood, which is comprised of two Census Tracts: 11001007809, where 609 of 1,135 total households—53.6%—according the USDA ERS FARA, and tract 11001007806, where 330 of 964 total households—34.2%—both of which have many households that do not have access to fresh whole foods within a mile radius. Ward 7 is comprised of 29 different neighborhoods and has a total population of 66,303. Deanwood is located along the northeastern edge of Ward 7. Along with Ward 8, 7 is physically separated from the other wards of Washington, DC, by the Anacostia River.³⁶ The Anacostia is not the only barrier between Ward 7 and the rest of the District, however. Of the eight wards, 7 suffers from some of the lowest median household income and per capita income values for the District. For 2014, median household income stood at \$39,828 and per capita income (aka income per person) stood at \$22,921, an average that is not only low for the District, but also for the nation.³⁷ The low-income numbers are even more striking when compared to Wards 1, 2, 3, 4, and 6, where average per capita income can reach well beyond \$85,000, even as high as \$220,000.³⁸ Despite the existence of financial barriers, the Ward 7 neighborhoods still have a charm of their own. Ward 7's most notable feature, especially when compared to other wards, is its plethora of greenspaces, several of which are Civil War fort sites that have been changed into parklands.

³⁶ “About Ward 7,” Office of Planning, n.d., accessed December 23, 2016, <http://planning.dc.gov/page/about-ward-7>.

³⁷ Hamilton, Marshall. “Development Feasibility: Anacostia.” Masters Capstone diss., Georgetown University, 2016.

³⁸ “Washington, District of Columbia (DC) Income map, Earnings map, and Wages Data,” City Data, n.d., accessed December 29, 2016, <http://www.city-data.com/income/income-Washington-District-of-Columbia.html>.

Bounded by Eastern Avenue, Kenilworth Avenue, and Nannie Helen Burroughs Avenue, Deanwood is characterized by small, detached single-family houses (generally between 900 and 1,200 ft²), relatively large front yards, and prominent tree cover, making it seem far more suburban when compared to the rest of DC. The historic neighborhood evolved from former slave plantations in the post-Civil War decades, and is one of the District's earliest majority-Black communities, as its location away from the District's center prompted its "country-town atmosphere and a do-it-yourself ethic".³⁹ In a *Washington Post* interview, Reverend Brian W. Jackson of the Randall Memorial United Methodist Church (along Sherriff Road, just south of the Deanwood Metro Station), stated, "Today we have a diverse neighborhood with people who've been here their [entire] lives—even several generations of one family—mixed with newcomers, some from different economic strata. You can watch the community change in front of your eyes, yet there's a level of dignity and resilience that's part of its long-term character."⁴⁰ Deanwood's wood-frame and brick housing dates to the early 20th Century. Despite its humble size, the neighborhood was home to some historic figures including Nannie Helen Burroughs, a Civil Rights leader who in 1909 founded the still-existing National Training School for Women & Girls, an independent boarding school for Black girls that resides on 50th Street. Marvin Gaye (memorialized by the Marvin Gaye Park along Division Avenue, just south of Deanwood) was also born and raised in the neighborhood.⁴¹

³⁹ Hoffer, Audrey, "Where We Live: Northeast D.C.'s Deanwood is a Patchwork of Progress," *The Washington Post*, July 25, 2014, accessed December 16, 2016, https://www.washingtonpost.com/realestate/where-we-live-in-northeast-dcs-deanwood-a-patchwork-of-progress/2014/07/24/6400d06c-05f0-11e4-bbf1-cc51275e7f8f_story.html?utm_term=.c8a1e1c5d4c4.

⁴⁰ Audrey Hoffer, "Where We Live: Northeast D.C.'s Deanwood is a Patchwork of Progress"

⁴¹ Audrey Hoffer, "Where We Live: Northeast D.C.'s Deanwood is a Patchwork of Progress"

The neighborhood was established when white landowner and slaveholder, Levi Sheriff (the namesake of Sheriff Road), who divided his farmland between his 3 daughters—who then divided the land into subdivisions: Whittingham, Lincoln Heights, and Burrville, which came to be known as Deanwood after being passed down to Julian Dean, Sheriff's grandson. At first, selling plots of land went slowly, and it would be nearly another 20 years before Levi Sheriff's grandson Julian Dean would build 20 houses on his new subdivision, Deanwood. Today's residents agree that Deanwood remains an historically stable, self-reliant, self-sufficient and close-knit primarily Black community. Faith is a major aspect of the history and culture of Deanwood--originally there were 7 churches—the first was the Contee African Methodist Episcopal Zion Church, 1885—and now there are 12 within the boundary of the neighborhood. Churches played a key role in Deanwood's social environment—organizing picnics, baseball games, trips and other events. It was the Tabernacle Baptist Church which was organized in 1911 at the intersection of Division Ave and Gay St, across the street from the proposed thesis site, which stands as the fourth church established in Deanwood.

The urban fabric of the Deanwood neighborhood is characterized by duplex and apartment housing, a host of transit amenities, civic buildings and spaces, as well as institutional buildings. But also present are a Capital Bikeshare station along Minnesota Avenue and two more along Nannie Helen Burroughs Avenue. Traveling by car, Deanwood is about 15 minutes from downtown Washington, DC, and the area is serviced by four Metro stations—Deanwood and Minnesota Avenue on the Orange Line, and Benning Road and Capitol Heights on the Blue and Silver lines. The Metrobus's U4 route runs through the center of the neighborhood along Sheriff Road, while other bus lines run along its bounding streets. A myriad of schools speckle the Deanwood neighborhood—Burrville Elementary, Aiton Elementary, Houston Elementary,

Smothers Elementary School, IDEA Public Charter School, Kelly Miller Middle School, H.D. Woodson High, and Ron Brown High School. Many of the other large and notable buildings within Deanwood include numerous Baptist and Methodist churches, the Republic National Distribution Center, the Metropolitan Police Department, the Deanwood Rehab & Wellness Center, and the Deanwood Recreation Center.



Figure 19: Immediate Site Aerial | Bounding Streets & Avenues (image by author)



Figure 20: Immediate Site Aerial | Looking South, Google Earth Pro



Figure 21: Immediate Site Aerial | Looking North, Google Earth Pro



Figure 22: Figure-Ground | Deanwood + Surrounding Fabric (image by author)



Figure 23: Site within Deanwood (image by author)



Figure 24: Watts Branch (waterway) & Park Space (image by author)



Figure 25: 100 & 500-year Floodplain (image by author)

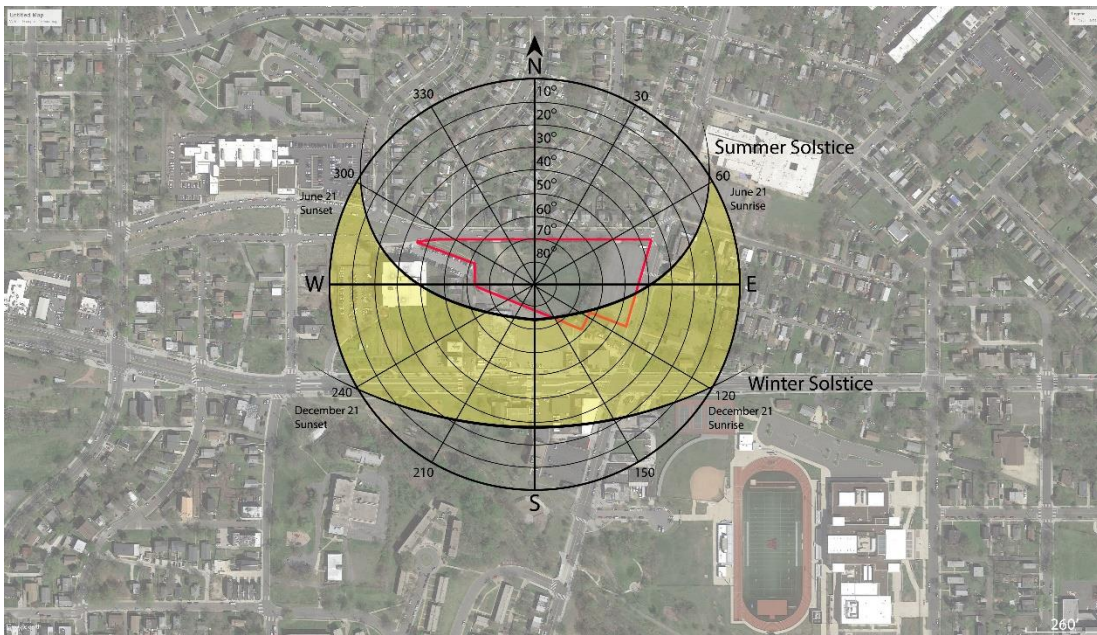


Figure 26: Sun Diagram for Site (image by author)



Figure 27: Nearest Grocery Stores (image by author)



Figure 28: Deanwood, Minnesota Ave. & Benning Road Metro Stations (image by author)

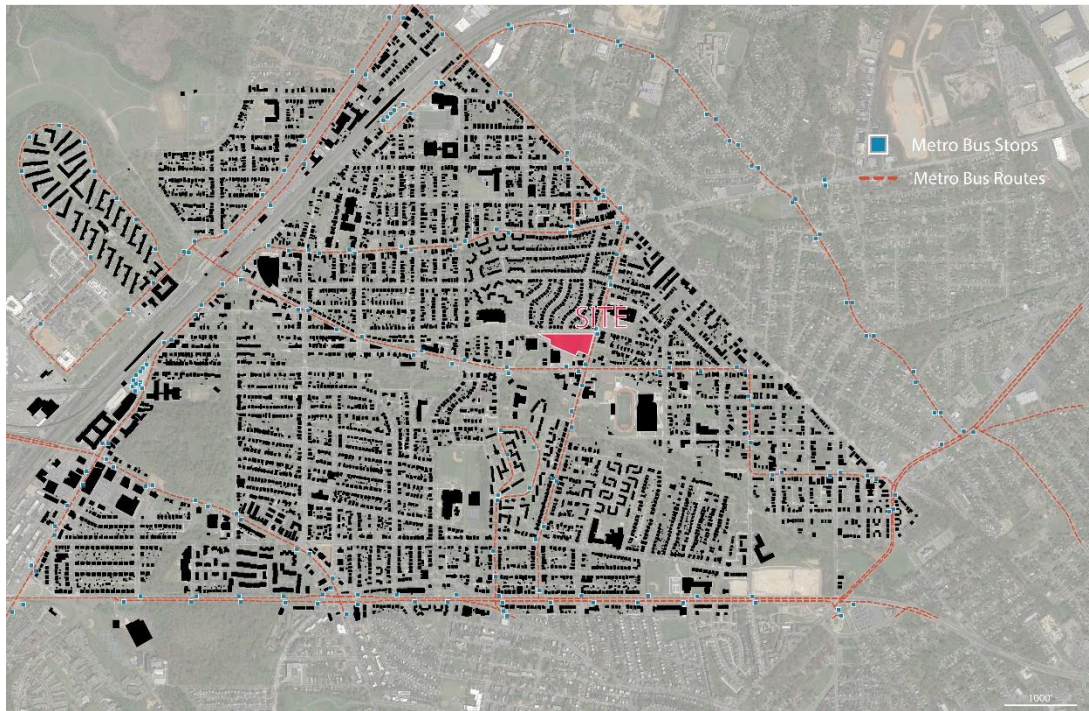


Figure 29: Metro Bus Routes & Stops (image by author)

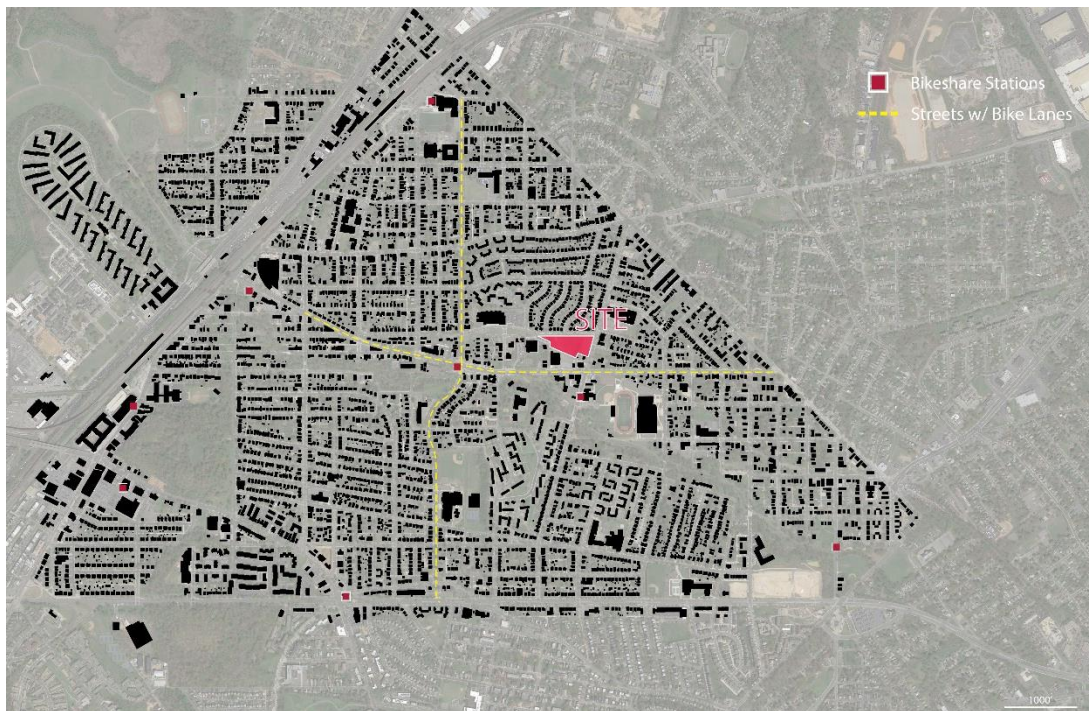


Figure 30: Capital Bikeshare Stations & Bike Lanes (image by author)



Figure 31: Site Zoning (image by author)

Based on the Zoning Handbook and digital zoning map of the DC Office of Zoning, the thesis site encompasses three parcels of land, wherein the two lots along Division Avenue, currently a dilapidated parking lot, have been designated as MU-3. The large, currently gated green space on Hayes Street is considered a single lot and has been designated a PDR-1 zone. The MU-3 zoning is “intended to permit low-density mixed-use development and provide convenient retail and personal service establishments for the day-to-day needs of a local neighborhood, as well as residential and limited community facilities with a minimum impact upon surrounding residential development.”⁴² MU-3 designated lots within the District have a maximum floor-area ratio (FAR) of 1.0 for non-residential buildings, with 3 stories being the maximum number of stories for any building or structure (for the MU-3 zoning, building height

⁴² DC Office of Zoning, “Mixed-Use (MU) Zones - MU-3,” 2016 Zoning Regulations Handbook, March 24, 2016, accessed December 30, 2016, <http://handbook.dcoz.dc.gov/zones/mixed-use-2/mu-3/>

is specified as 40 ft., but only for residential buildings).⁴³ This thesis does not feature any residential program. In selecting the overall site, this thesis takes the stance that the proposed Food Hub *is* an example of a “personal service establishment [created to meet] the day-to-day needs of a local neighborhood.”

For the larger parcel of land, the PDR-1 zoning is “intended to permit moderate-density commercial and [production, distribution and repair] activities employing a large workforce and requiring some heavy machinery under controls that minimize any adverse impacts on adjacent, more restrictive zones.”⁴⁴ PDR-1 designated lots within the District have a maximum FAR of 3.5, where only agriculture; animal care and boarding and animal shelter; arts, design, and creation; basic utilities; large-scale government; production, distribution, and repair; and waste-related services may qualify to achieve the maximum. All other permitted, conditional, or special exception use categories are subject to the maximum restricted uses. The maximum building height that PDR-1 zoning permits is 50 ft., with some exceptions. For every foot over the 50-foot mark, the exception building types must be set back from the boundary of the lot lines an equal amount, with the maximum height being 90 ft.⁴⁵ Although heavy machinery is not a part of the proposed program of the Food Hub, agricultural production and distribution are vital components of the day-to-day operation of this new local market. So, it seems only fitting to use a site with a PDR-1 zone designation.

⁴³ DC Office of Zoning, “Mixed-Use (MU) Zones - MU-3,” 2016 Zoning Regulations Handbook, March 24, 2016, accessed December 30, 2016, <http://handbook.dcoz.dc.gov/zones/mixed-use-2/mu-3/>

⁴⁴ DC Office of Zoning, “Production, Distribution & Repair (PDR) Zones - PDR-1,” 2016 Zoning Regulations Handbook, March 24, 2016, accessed December 30, 2016, <http://handbook.dcoz.dc.gov/zones/production-distribution-and-repair/pdr-1/>

⁴⁵ DC Office of Zoning, “Production, Distribution & Repair (PDR) Zones - PDR-1”

Soil Survey

Per the digital Web Soil Survey map provided by the USDA Natural Resources Conservation Service, the area has a mean annual precipitation of 38 to 44 inches, and the larger parcel of land is made up of “U10” or udorthents, clayey and smooth soil. The typical profile for “U10” soil is that the first 2 inches or so are clay loam and the next 2 to 65 inches are clay.⁴⁶ Loam soil containing a small amount of organic material is considered optimal for agricultural production. The mineral distribution in a loam soil is ideally about 40% sand, 40% silt and 20% clay by weight. The loam soil’s texture, especially its ability to retain nutrients and water are crucial, and what make it best for supporting food growth. Between clay, loam and sand, clay soil holds the most water, which may be good for certain plants, but is not good for growing crops.⁴⁷ The large amount of clay on the site means that it is not prime farmland and some work will need to be done with the soil to prepare for production.

Soil testing provides the opportunity to figure out what nutrients are not available within the soil. More specifically, a soil test will identify the existing levels of plant-available phosphorus (extractable sodium bicarbonate), potassium, magnesium (extractable ammonium acetate), manganese and zinc (index of soil pH and extractable element), pH (the acidity of the soil), lime requirement (serves as a buffer pH—the soil’s ability to resist changes in pH). “[The goal is] to have a balance of all these nutrients. The balance of [soil] nutrients is what ensures that [the] crop grows. Some crops use more of one nutrient, so [those maintaining the land will] need to know what to put back into [the] soil to get the best crop.”⁴⁸ Soil’s importance in

⁴⁶ “Soil Map,” USDA Natural Resources Conservation Service, last modified 2016, accessed January 9, 2017,

<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

⁴⁷ “New Farmers’ Guide to Soil Management,” My Farm Education, last modified October 9, 2013, accessed January 9, 2017,

<http://myfarmeducation.ca/farming/new-farmers-guide-to-soil-management/>

⁴⁸ “New Farmers’ Guide to Soil Management,” My Farm Education, last modified October 9, 2013, accessed January 9, 2017, <http://myfarmeducation.ca/farming/new-farmers-guide-to-soil-management/>

agriculture is paramount, and because the nutrients that soil provides to the crops being grown within it, those nutrients will need to be replaced, crops will need to be rotated to different plots of the site to keep the soil from being drained of nutrients too quickly, the soil will need to be tilled for aeration, and much more. In fact, most of the maintenance cost associated with maintaining the urban farm will go testing and taking care of the soil.⁴⁹

Chapter 4: Program Analysis

Agricultural processes have been made both complicated and invisible by how extensive, or perhaps, how contrived the process of feeding someone is today. For most of agriculture's history, not just in the United States, but also globally, the path from farm field to dinner plate has been far more concise than it is today. The United States has established an infrastructural system that feeds many of its citizens, but the problems that have surfaced because of the many layers and steps involved in feeding America's people are not necessary evils.

The most compelling precedent models—the CSA farm and the food co-op—in responding to this invisible infrastructure, begin to uncover the process of food production and distribution by creating a network of people who farm and who shop, blending the two. Community-supported agriculture, as the name suggests, forms a direct line of support and investment. For this thesis, architecture occurs the moment at which this network of farmers and shoppers is made visible and encouraged to know and learn from one another. Food cooperatives unite active community members in the name of achieving a goal. The proposed architecture will be a Food Hub intended to aid in encompassing, encouraging, and sustaining a local food network.

⁴⁹ “New Farmers’ Guide to Soil Management,” My Farm Education, last modified October 9, 2013, accessed January 9, 2017, <http://myfarmeducation.ca/farming/new-farmers-guide-to-soil-management/>

Program Precedents

To get a strong understanding of rooms and spaces can contribute to a cohesive food experience, two program precedents have been selected. Growing Power, Inc., an urban farm of roughly the same size as the Deanwood site, in Milwaukee, WI on 5500 W Silver Spring Dr. and the Milwaukee Public Market, a successful combination of enclosed public market and seasonal farmers' market.



Figure 32: Growing Power, Inc. Site Square Footage (image by author)

Growing Power, Inc.

The Growing Power, Inc. property is about 92,500 square feet, which is approximately 3 acres. Equipped with 6 greenhouses and 18 polyethylene “hoop houses”, the urban farm annually produces 88,100 (40 tons) of food, and feeds close to 10,000 people with about 150 different

crops (tilapia and yellow perch included). The farm also “grows” soil by using worms (vermicomposting) to deal with any vegetable and fruit scraps.⁵⁰



Figure 33: Milwaukee Public Market Site Square Footage (image by author)

Milwaukee Public Market

Finally, Milwaukee Public Market is located at 400 N Water St. in Milwaukee, WI. The 2-story market building is about 22,600 square feet per floor and hosts 20 food vendors, including different specialty meat and dairy vendors, a few bakeries, produce vendors, plus oil and vinegar suppliers. Milwaukee Public Market provides a seasonal farmers’ market on the weekends from June to October, just outside of the building. The public market also has an auxiliary building that serves as a café.

⁵⁰ “How to Feed 10,000 People from Food Grown on 3 Acres in the City,” The Splendid Table, last modified May 2013, accessed January 13, 2017, <https://www.splendidtable.org/story/how-to-feed-10000-people-from-food-grown-on-3-acres-in-the-city>.

Proposed Program

In designing a Food Hub that fosters both a grassroots community-scale agriculture as well as relationships between farmers and the people who buy their products, the following rooms/spaces will be necessary:

Production Zones

- 1) Production/Tool Storage [1,000 ft²]
- 2) Urban Farm Space [50,000 ft²]
 - a. Including a large agricultural garden space achieves a few things—1) people get to enjoy gardening outside, 2) seeing people working outside can compel others to venture over and inquire about getting involved, 3) the outdoor garden will serve as the proving ground for the vermicomposting (people will be able to witness firsthand the benefits and results when using it in their own gardening).
- 3) Vermicomposting Zone [300 ft²]
 - a. Seeing as the proposed Food Hub deals with the production, processing, and cooking of food, it only makes sense for the disposal component to not be neglected. The program of the hub will include a worm-based composting system to show employees, farmers, shoppers, and visitors how plant matter can be transformed into soil. Worm composting is using worms to create a valuable soil alternative called vermicomposting, or worm compost from scraps and other organic material. Worms eat the scraps, which become compost as they pass through the worm's body, which can be used to grow plants.

Worm compost is good for plants because the worms are eating nutrient-rich fruit and vegetable scraps, and turning them into nutrient-rich compost. Including this type of space in the program provides the Hub another means of income—the soil can be sold.

Market Zones

4) Marketplace [30,000 ft²]

- a. As a safeguard against suffering from a low-yielding season and/or lack of diversity in what is offered from the Indoor Hydroponic Farm, incorporate market space within the program for local farmers seems wise. A market component will provide multiple advantages: 1) the Deanwood neighborhood will be able to foster relationships with the farmers and vendors selling their products at the market and not solely depend on their own efforts, 2) the neighborhood's stakeholders will be able to learn different farming practices from the farmers that sell at the market, while also showcasing and teaching hydroponic techniques, 3) the marketplace will enable more people than the residents living directly in the neighborhood to have access to farm-fresh produce, meats, and other products, and 4) a broader range of foodstuffs can be made available to those participating in this network—diversity matters. Adjacent to the market should be space for the vendors and farmers associated with the market to park and offload their products for sale.

5) Market Reception/Loading Dock [500 ft²]

6) Commercial Refrigerator [200 ft²]

7) Commercial Freezer [200 ft²]

8) Mechanical Closet [1,500 ft²]

9) Commercial Storage [1,000 ft²]

10) Parking [30,000 ft²]

- a. Employees, farmers, vendors and even visitors need some level of parking. There is street parking on every street bounding site, however, so the parking does not need to be extensive. For those requesting that their produce box be delivered, there will also be delivery trucks that can distribute the boxes and need parking spaces.

Processing Zone

11) Quality Control & Packaging Space [1,000 ft²]

- a. This Food Hub will function as a CSA, and therefore, anyone working on either a full-time, part-time basis, or volunteer basis, will be responsible for quality-checking and boxing shares of the harvest from not only the community's urban farm, but also from the farms partnered with the Food Hub. This space, adjacent to the Receiving Area/Loading Dock, will offer the necessary space for the Food Hub's employees and volunteers to sort through, rinse, and box the harvest shares for everyone invested in the Hub.

Employee & Communal Zones

12) Employee & Volunteer Offices [1,500 ft²]

- a. There will need to be offices for the full-time and part-time employees. The volunteers may use a shared-space office. 15 employees (full-time and/or part-time) will have office space. The equivalent of 5 employee office spaces will be allotted to those serving as volunteers, as shared office space.

13) Meeting Rooms [375 ft² x 2 | 750 ft²]

- a. Two large meeting rooms for gatherings of all the stakeholders (Food Hub employees, volunteers, farmers and vendors) will need to be made available. This room may also serve as the dining hall.

14) Classroom(s) [750 ft²]

- a. The classroom space will be flexible in that walls can be manipulated to create one large space or multiple small classrooms. It will be adjacent to the community garden, which will allow those who are growing and harvesting to discuss agricultural practices. One could even imagine small lectures regarding sustainable farming practices being held year-round.

15) Office & Classroom Storage [500 ft²]

16) Test Kitchen [2,000 ft²]

- a. The final step in teaching people how to engage with food is teaching them how to prepare it. Small test kitchens will be provided to hold cooking classes.

17) Communal Refrigerator [200 ft²]

18) Communal Freezer [200 ft²]

19) Mechanical Closet [1,500 ft²]

Poché Zones

20) Bathrooms [800 ft²]

a. 2 Men's and 2 Women's (150 ft² each), 2 Family/Unisex (100 ft² each)

21) Fire Stairs [120 ft² x 2 | 240 ft²]

22) Elevators [100 ft²]

a. Elevators [20 ft²]

b. Freight Elevator (for market) [80 ft²]

Circulation Zone [10,100 ft²]

TOTAL SQUARE FOOTAGE | 130,840 ft²

Chapter 5: Architectural Response

Development of Scheme

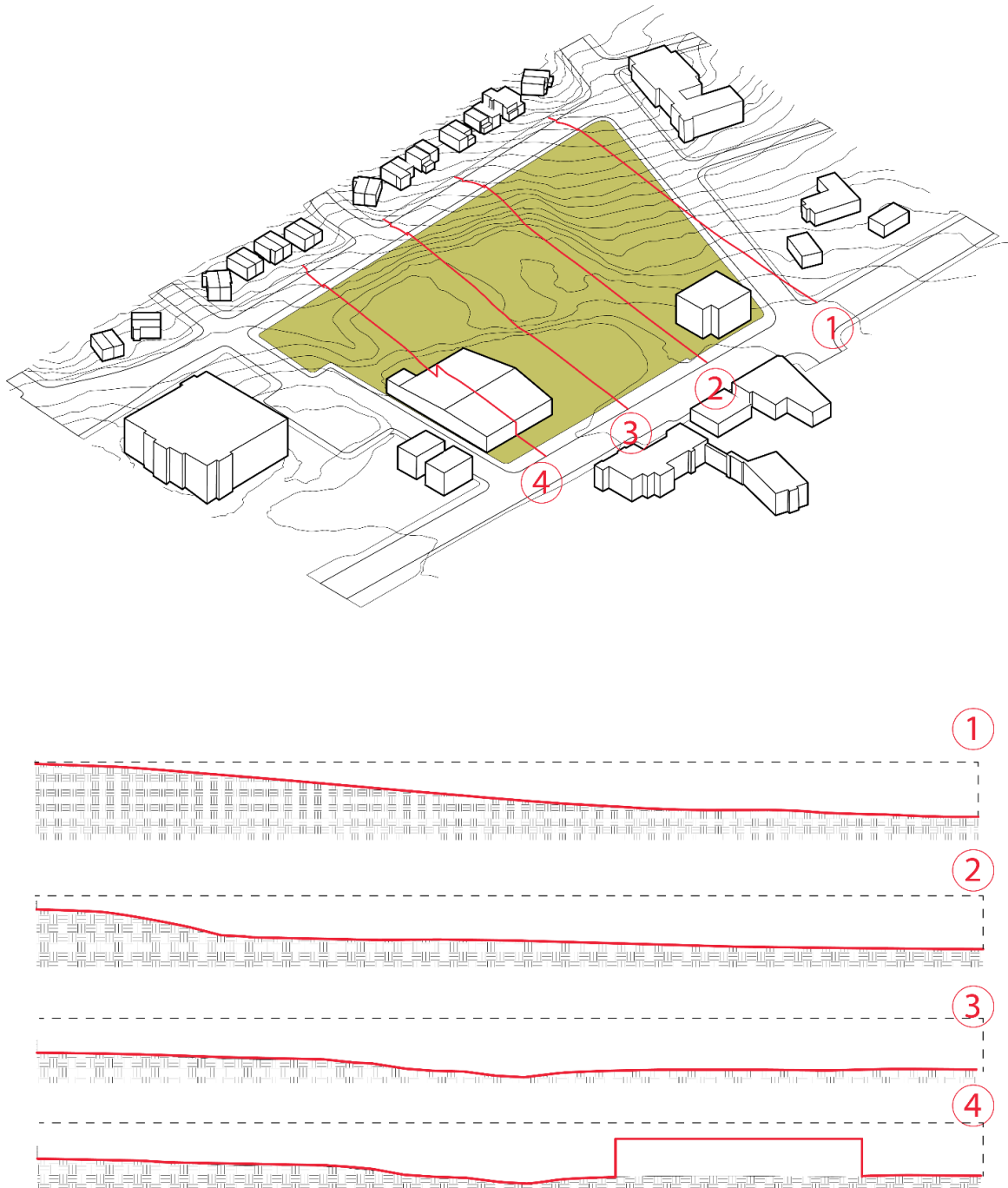


Figure 34: Understanding Site Topography (image by author)

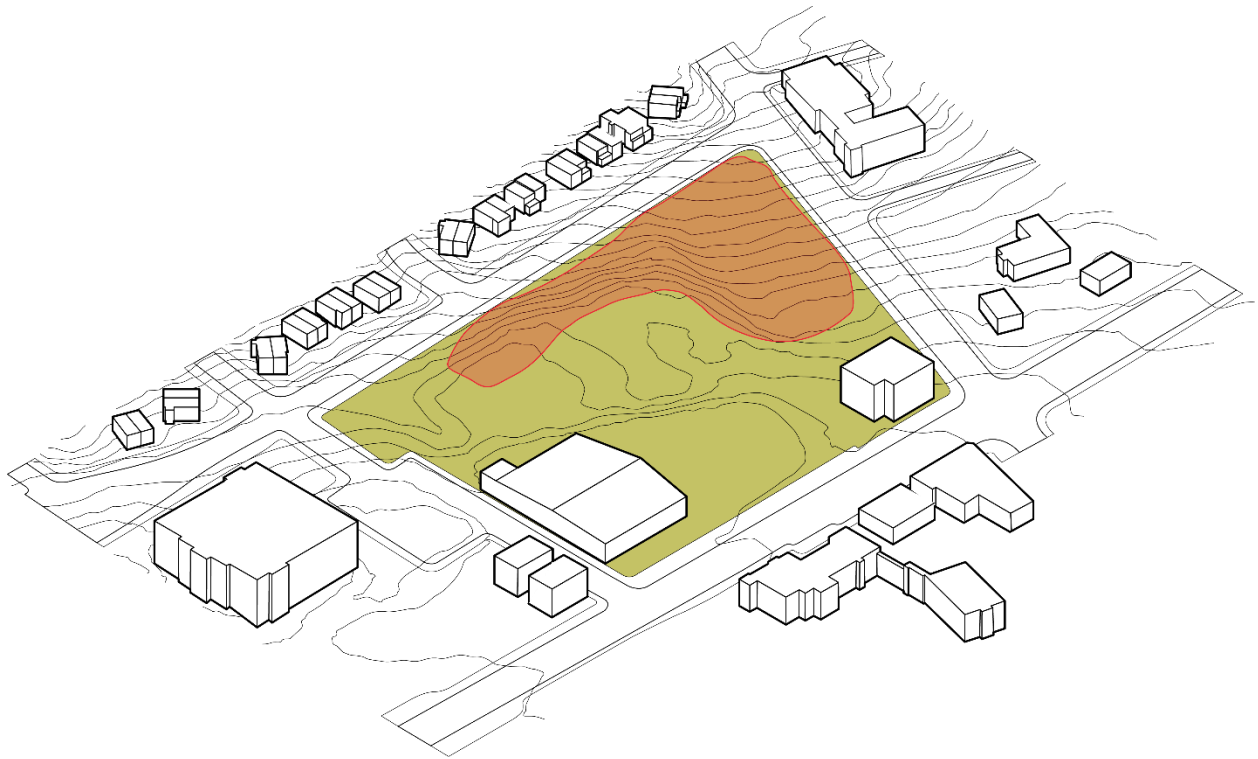
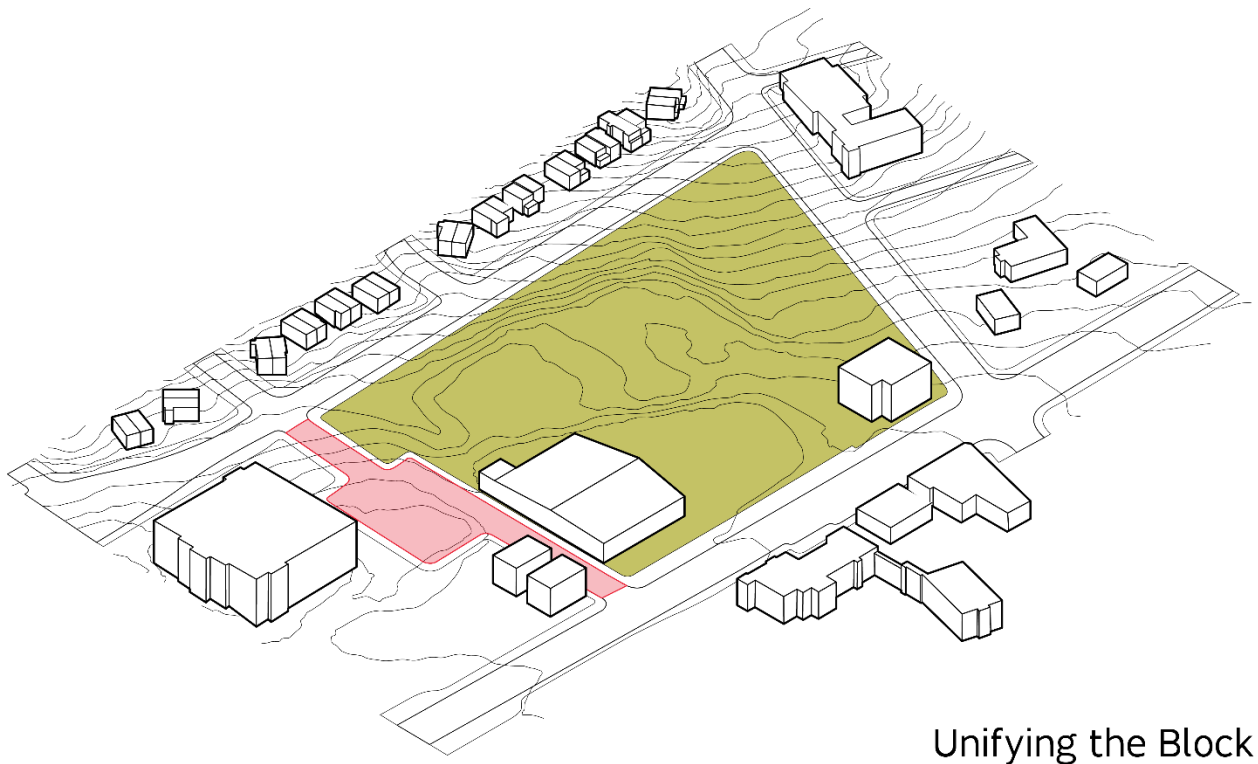
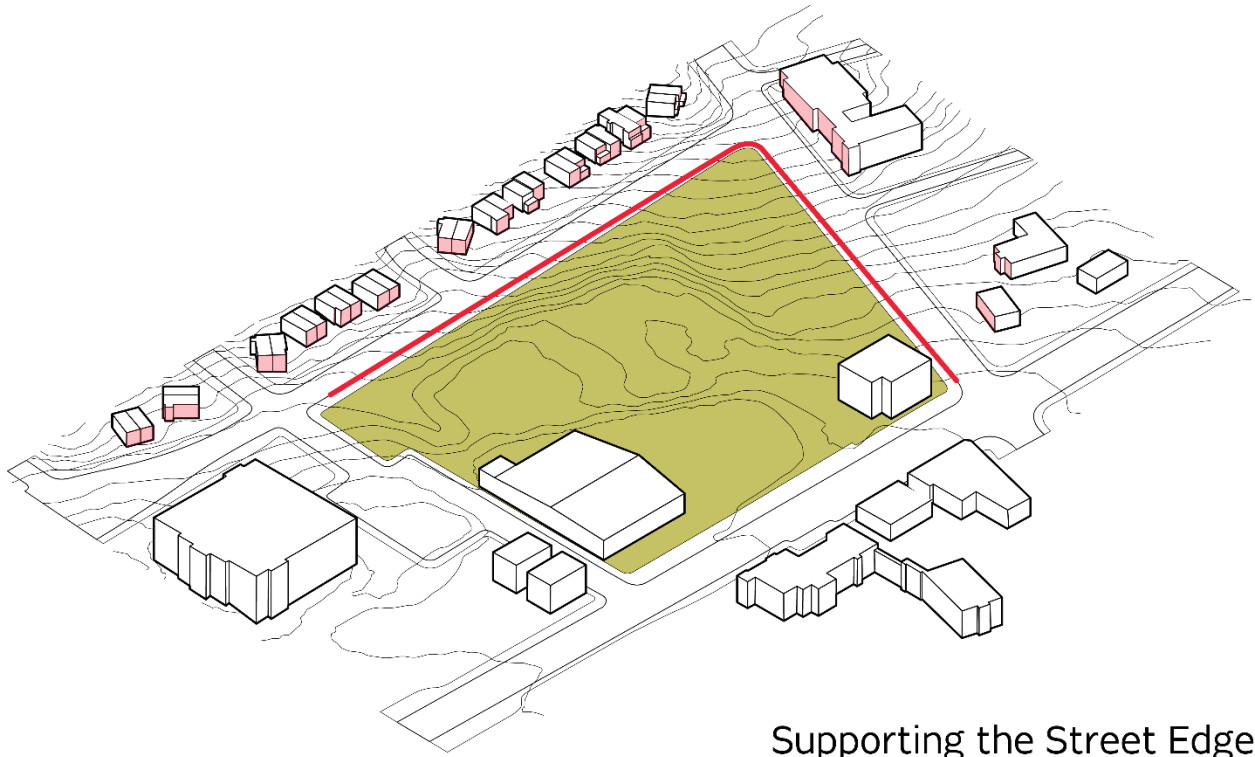


Figure 35: Area Needing to be Carved Away for Building (image by author)



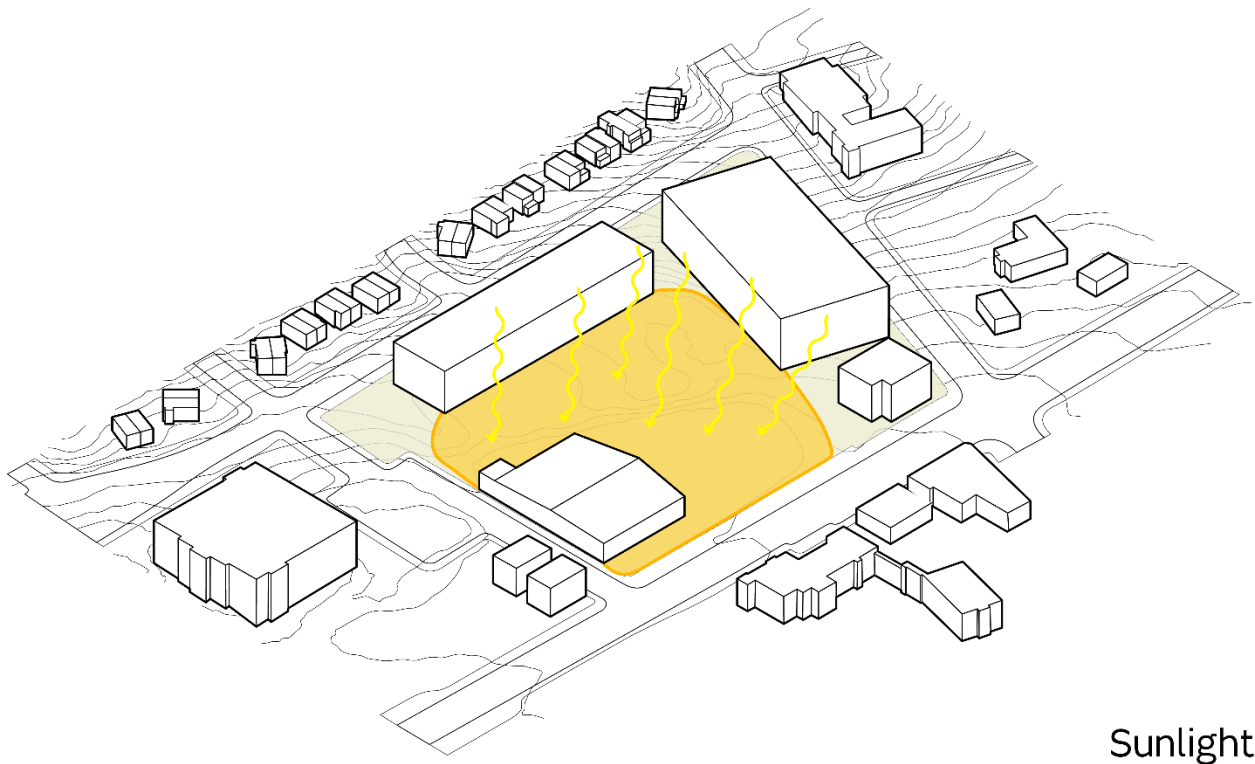
Unifying the Block

Figure 36: Addition of Parking Lot & Through-Street to Site (image by author)



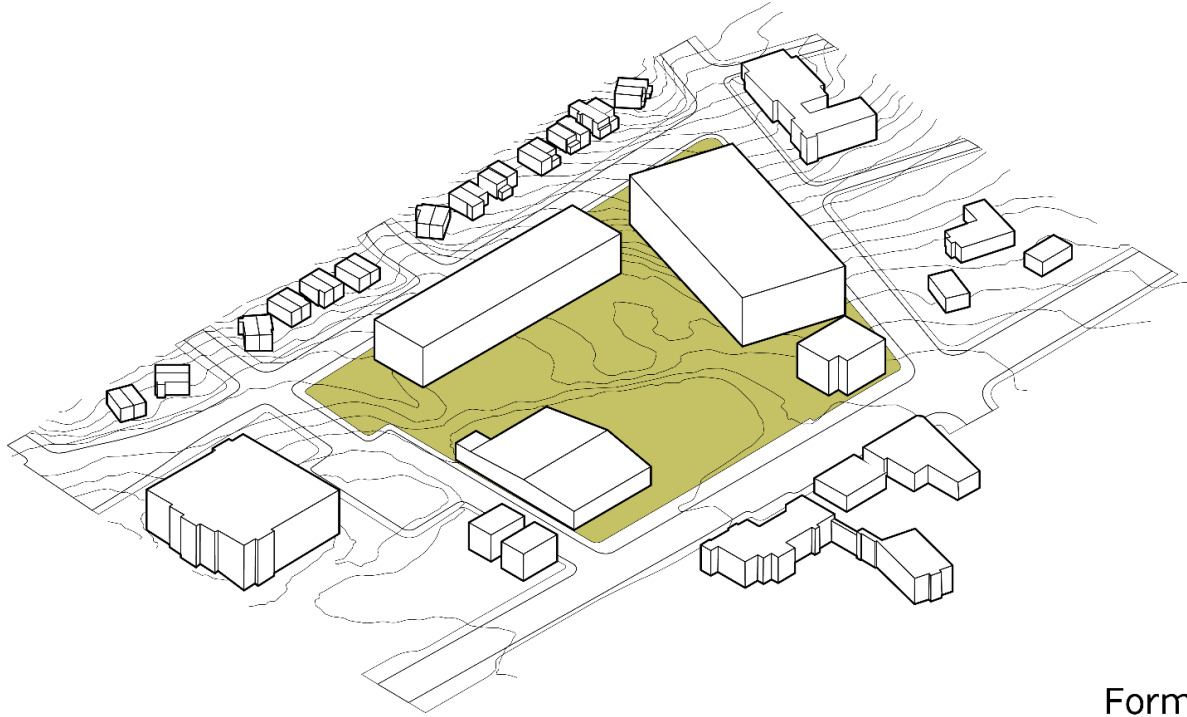
Supporting the Street Edge

Figure 37: Supporting Street Edge of Hayes Street & Division Avenue (image by author)



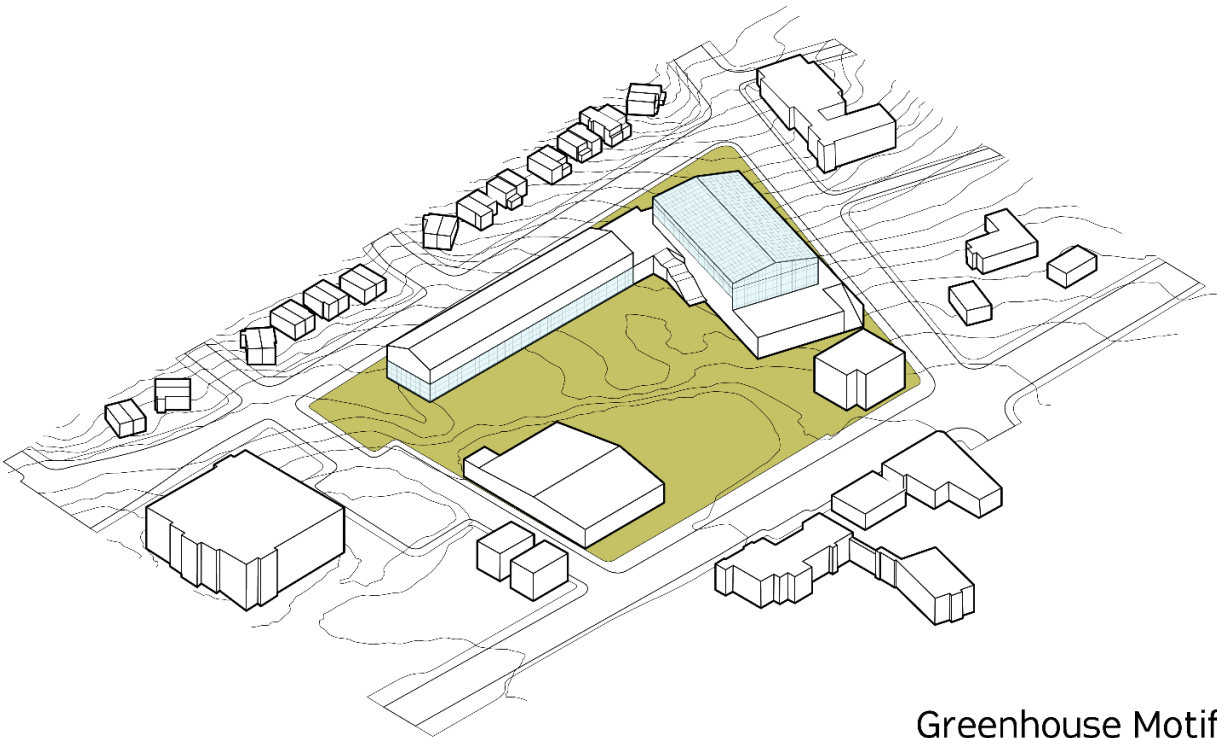
Sunlight

Figure 38: Sun-Exposed Area for Urban Farming (image by author)



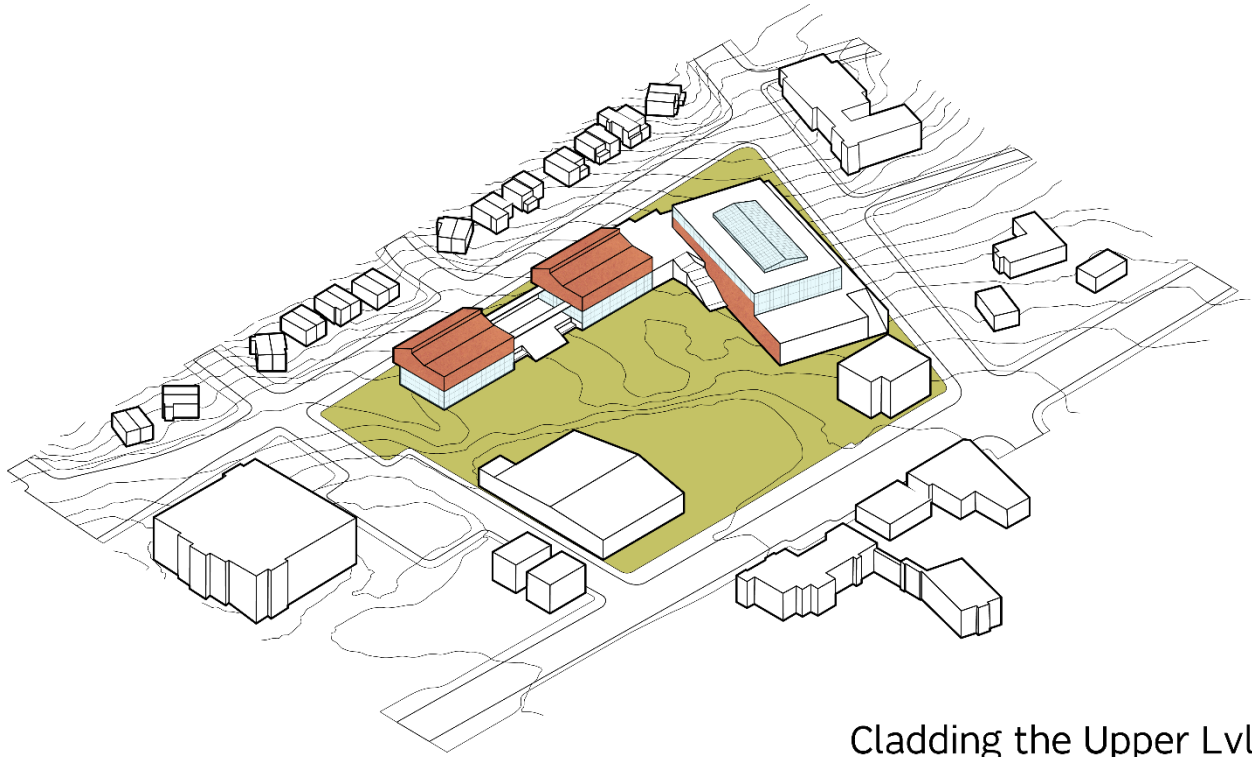
Form

Figure 39: Building Form Cradles Growing Space (image by author)



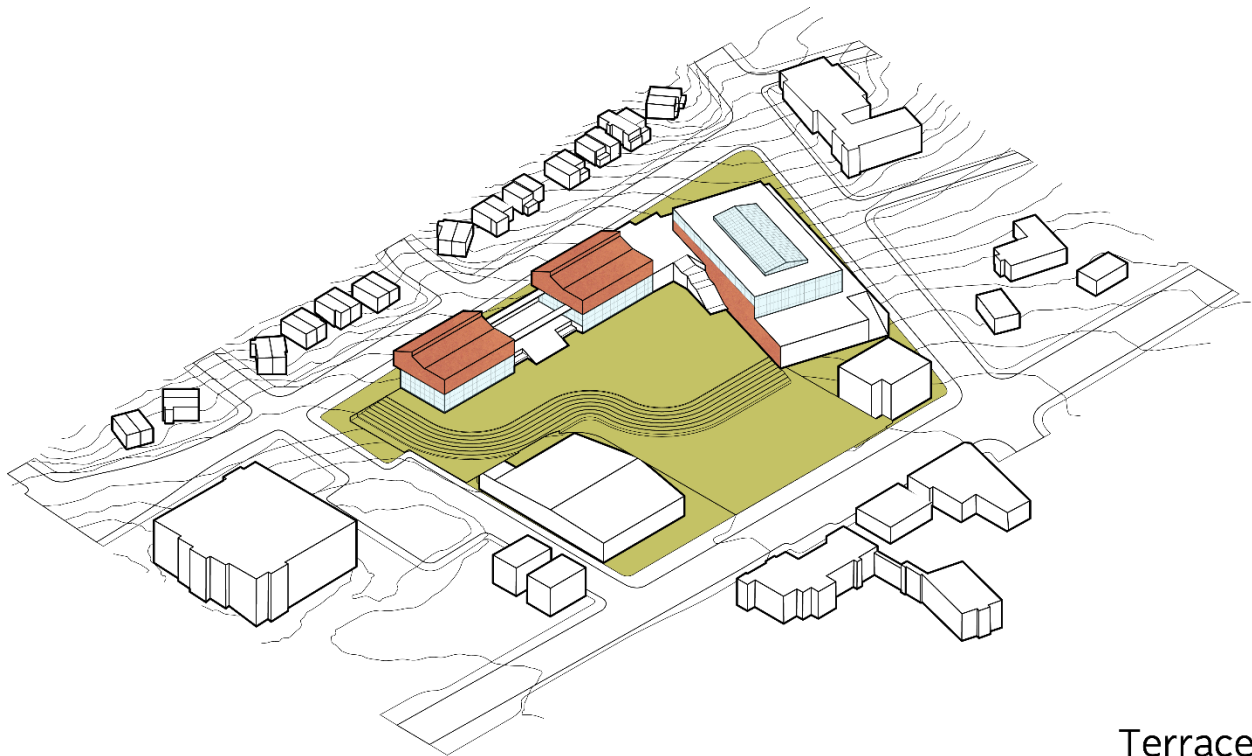
Greenhouse Motif

Figure 40: Greenhouse Aesthetic (image by author)



Cladding the Upper Lvl

Figure 41: Cladding Upper Level in Corten Steel (image by author)



Terrace

Figure 42: Terracing for Urban Farm (image by author)

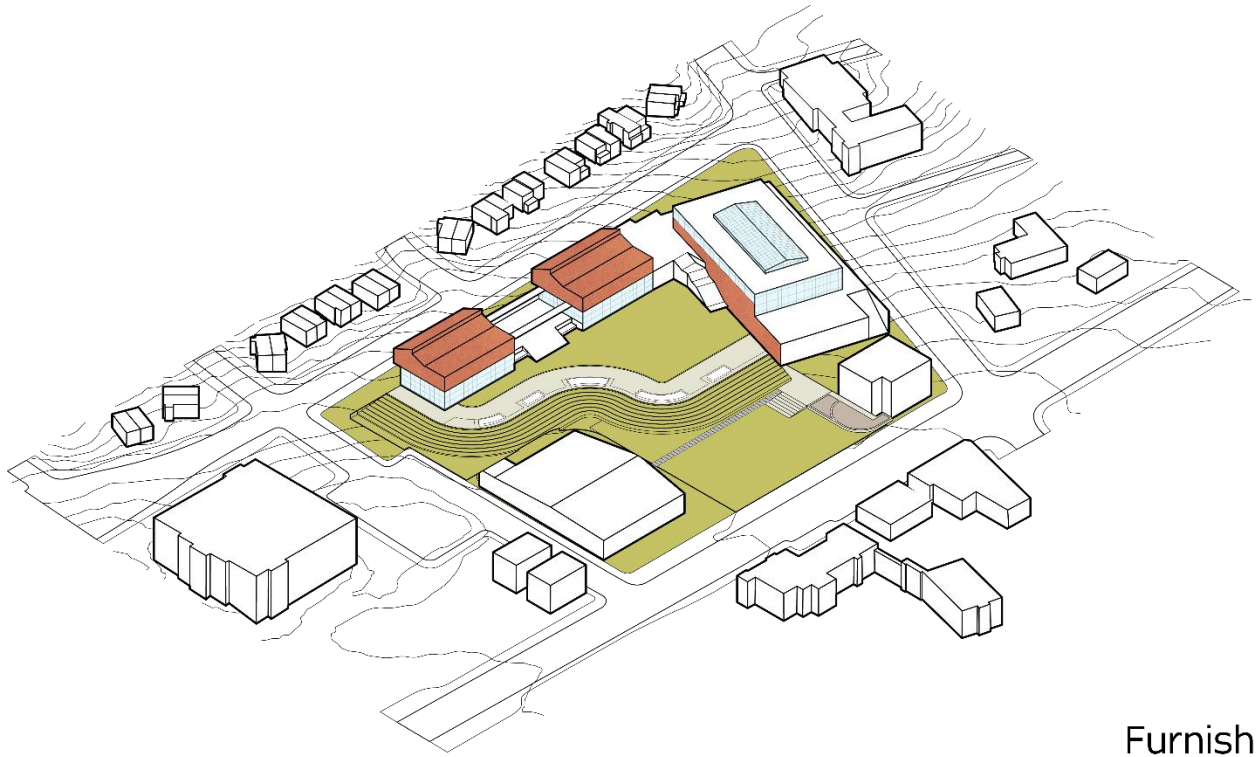


Figure 43: Adding Outdoor Furnishings | ADA Path, Tables, Waist-Height Garden Plots
(image by author)

The proposed building is supported by a steel frame structure—18”- diameter round, steel columns positioned at 25’ on-center, with various truss systems supporting the different roof structures. This building cannot be an ephemeral building—made of light materials that lightly touch the earth—because it takes a clear stance on how citizens should engage with their fellow farmers and shoppers—and that stance should be manifested in a permanent way.



Figure 44: View from Parking Lot Perspective (image by author)



Figure 45: Agricultural Library Interior Perspective (image by author)



Figure 46: Agricultural Learning Center Bridge Perspective (image by author)

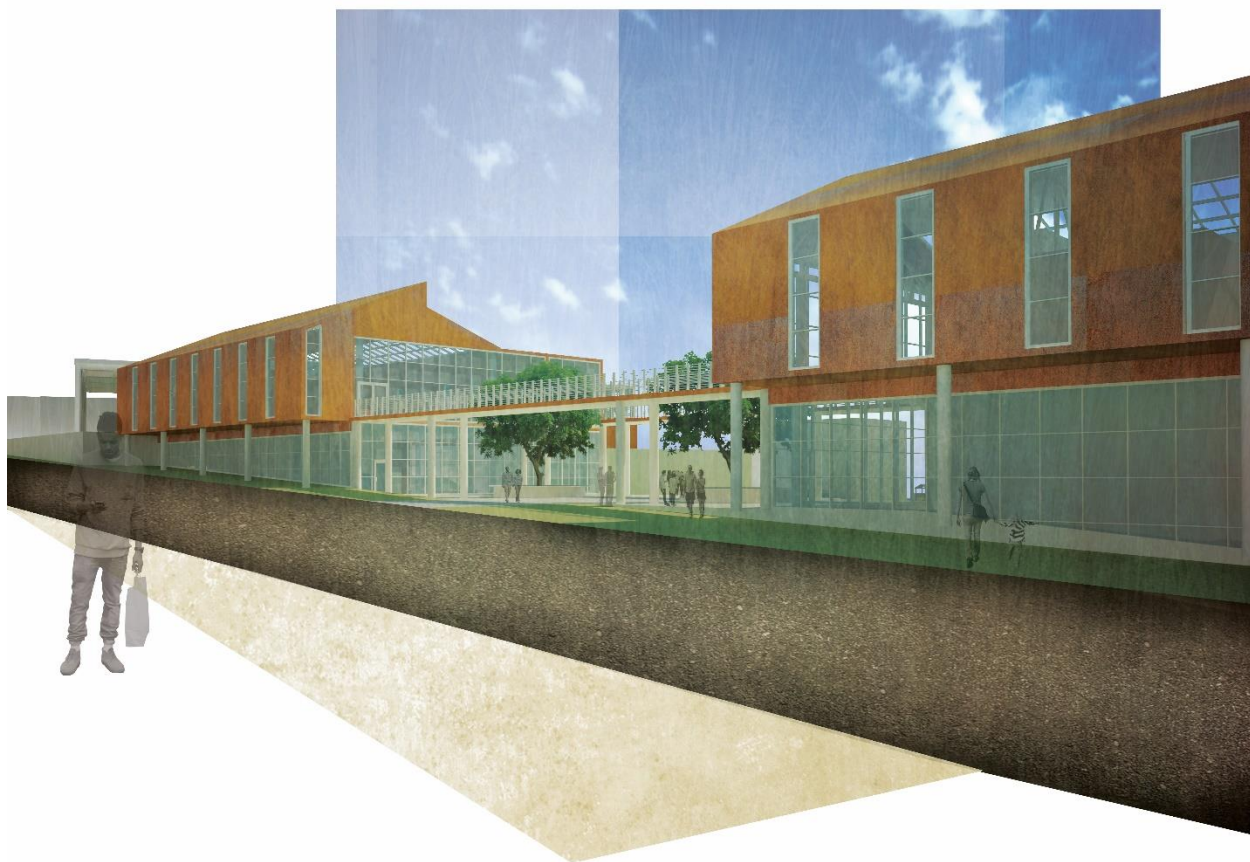


Figure 47: Hayes Street Façade Perspective (image by author)



Figure 48: Hayes Street Gateway Perspective (image by author)



Figure 49: Agricultural Learning Center | Test Kitchen & Outdoor Herb Garden (image by author)



Figure 50: Interstitial Plaza (image by author)



Figure 51: Market Hall Porch (image by author)



Figure 52: Market Hall Interior Perspective (image by author)

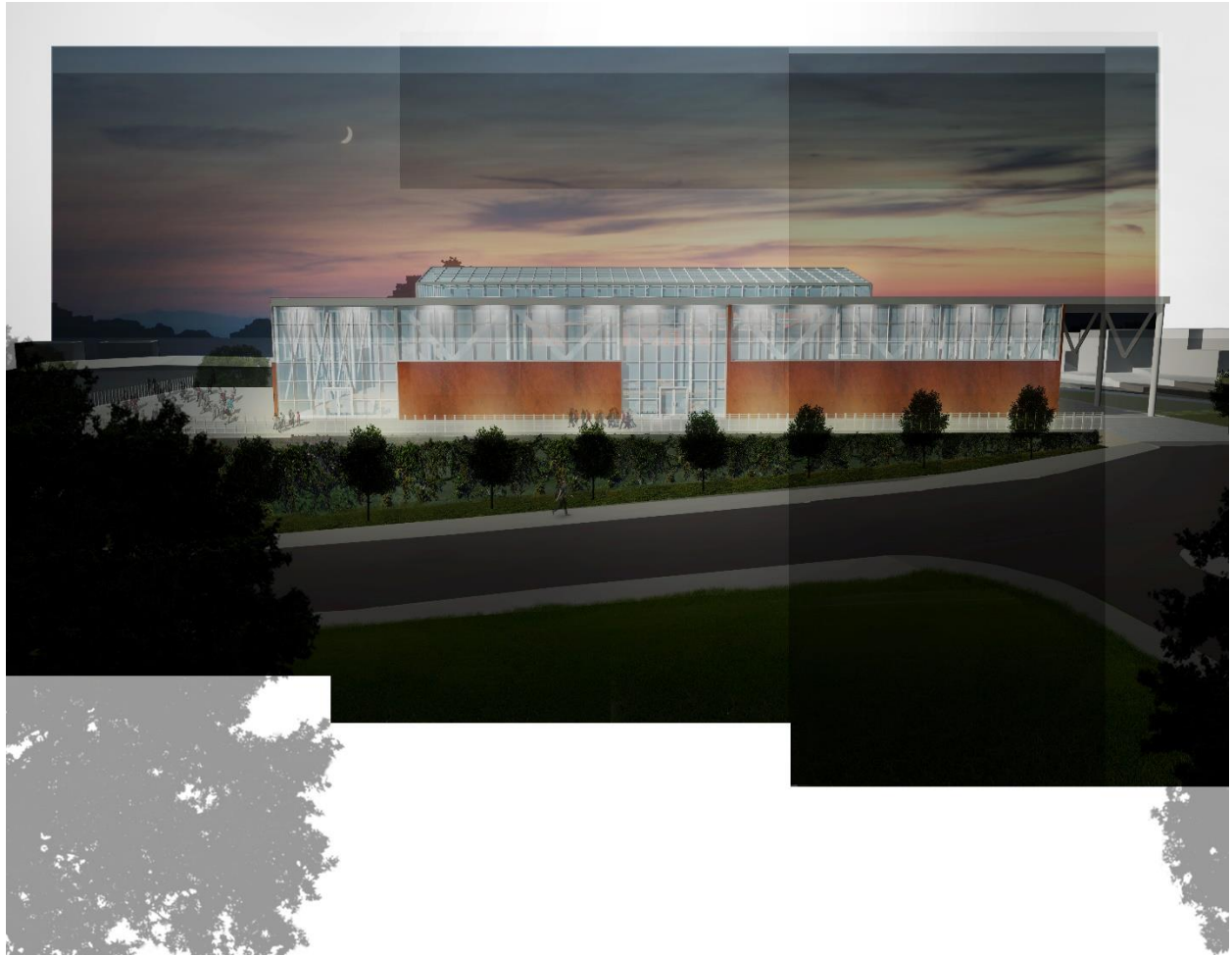


Figure 53: Market Hall| Division Avenue Façade Perspective – Night (image by author)



Figure 54: Market Hall | Outdoor Overlook to Urban Farm (image by author)

Chapter 6: Conclusion

In summation, our relationship with the food we grow, eat, and throw away, is ultimately a spatial issue, and a design-oriented perspective, especially an architectural one, has its place at the forefront of the solution. I have designed a food hub that features a marketplace, an urban farm, and spaces for learning in several ways—the Agricultural Learning Center. In terms of landscape, this thesis mediates between what is built and what is grown, while also having farm

space that is not solely productive, but experiential. This food hub exists as a civic building, having an institutional presence within the neighborhood, because its function is to serve as not only a marketplace to satisfy the needs of the Deanwood residents, but also a command center of sorts for those who want to learn about and be involved in agricultural processes. This food hub will be the place that connects farms to districts, to neighborhoods, to citizens. Instead of the current food network of the farmer to the distributor, to the grocer, to the store management, and finally to the consumer—a system that currently serves as a barrier to people really understanding their food—the proposed hub creates a simplified and local network of farmer to *citizen*. This place could easily become a vibrant hotbed and focal point designed to showcase community engagement with food—an institution that is driven by the citizens and neighborhoods that encompass it.

Below are the site plan, ground and second floor plans, which express the sequence of spaces that encompass the urban garden. The images that follow are the major sections of the buildings—a cut through the second building of the Agricultural Learning Center and a section cut through Market Hall.

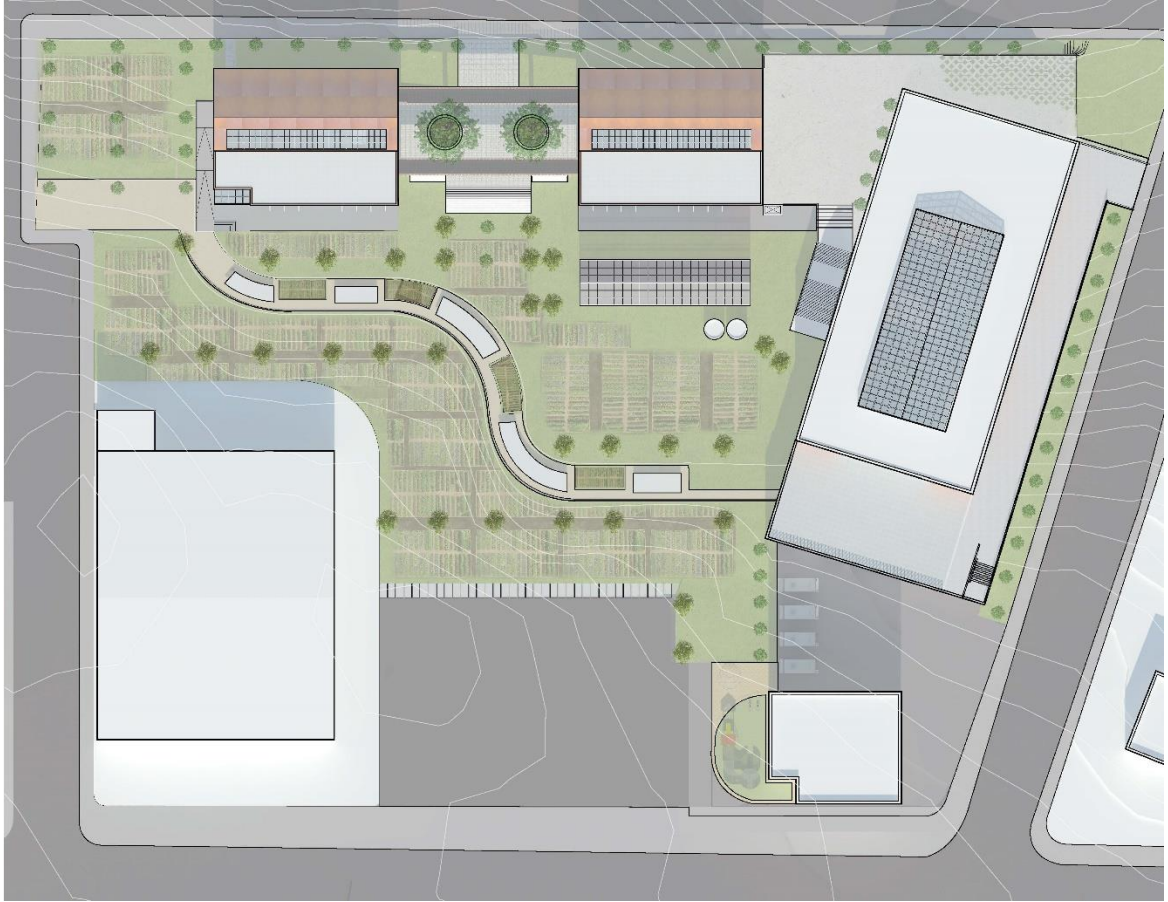


Figure 55: Site Plan (image by author)

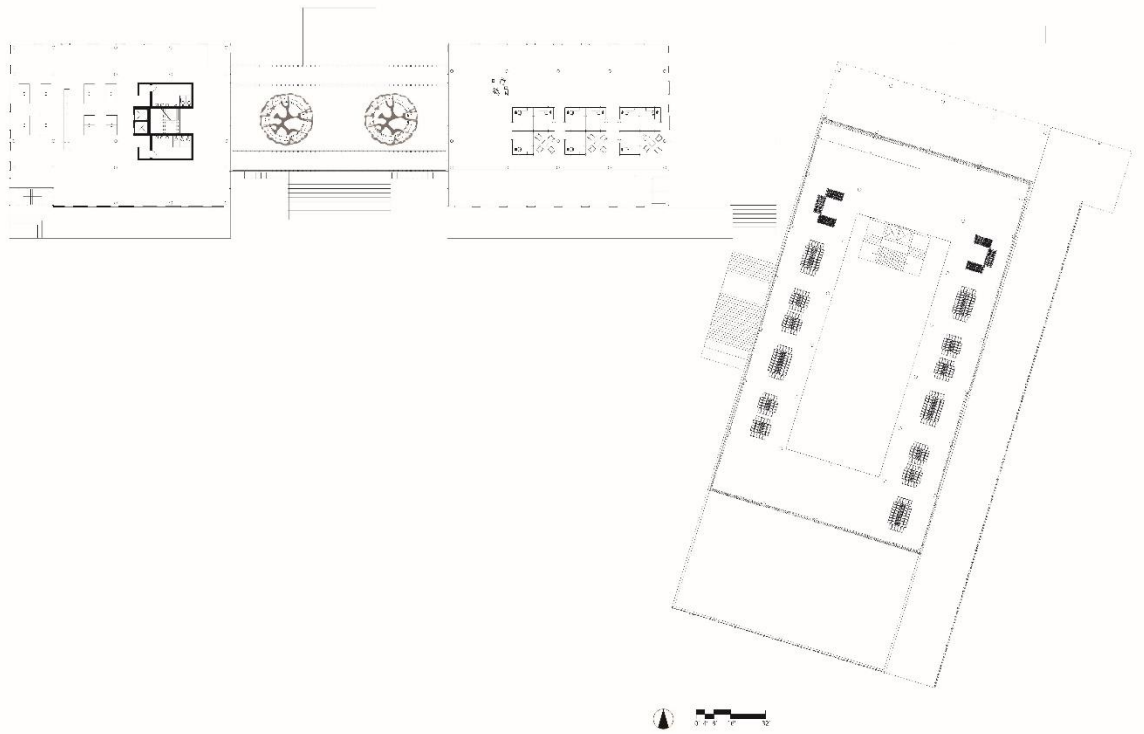


Figure 56: Second Floor Plan (image by author)



Figure 57: Ground Floor Plan w/ Site Context (image by author)

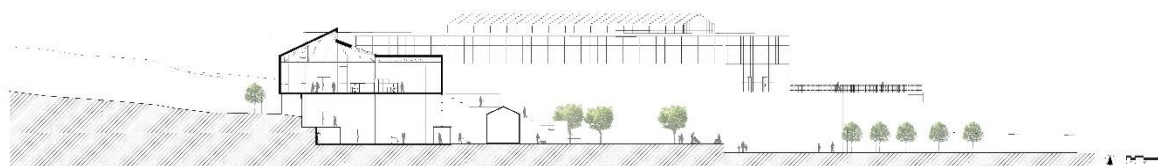


Figure 58: Agricultural Learning Center | Building 2 Section (image by author)

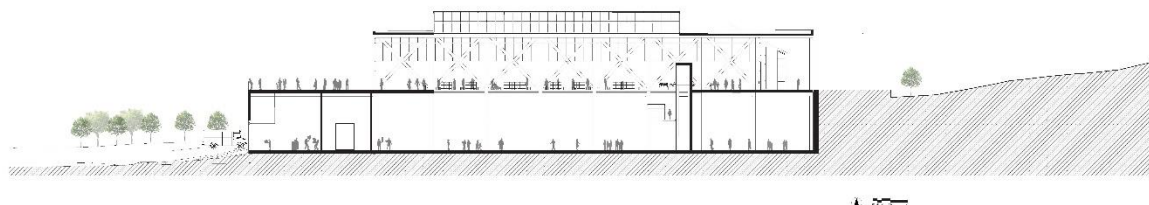


Figure 59: Market Hall Section (image by author)

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