

MOVABLE TRELLIS

ARCH 459/559 Top Sustainable Energy Landscapes
Professor: Yekang Ko
Brooke Ridgway, Deanna Lynn, Mia Eikani

A FLEXIBLE STRUCTURE FOR COOLING AND FOOD PRODUCTION AT OVE

This project will benefit the community by cooling the houses with shade and evaporative cooling from plants, producing fresh produce to help alleviate food insecurity, providing privacy, and providing special event space. The systems will be portable on wheels, allowing residents to customize the configuration and transport them if the village needs to relocate. Four different suggested configurations demonstrate the usefulness and adaptability of our structure. The first configuration is the trellis alone to provide privacy and produce for the community. The second configuration connects the structure to individual units that need cooling in the warm summer months with canvas fabric. The third configuration uses canvas fabric to connect the structures to each other, shading and cooling circulation spaces for all OVE's inhabitants. The fourth configuration connects the structures with wire for supporting edible vines for increased food production. The estimated cost for the project materials is \$120/structure or \$1270 total with two fabric awnings.

PRECEDENTS



Green wall for food production at Six-One.Six restaurant space
Arbor with vines divide and cool a space
Green screen cools building and outdoor space

PLANTS: EDIBLE OR NATIVE



'Himrod' Grapes
Fiveleaf Akebia
Hardy Kiwi
Orange Honey-suckle

DESIGN CONCEPT

Hooks for canvas awning or wires

Wire grid supports vines

Wood frame construction

Planter holds soil

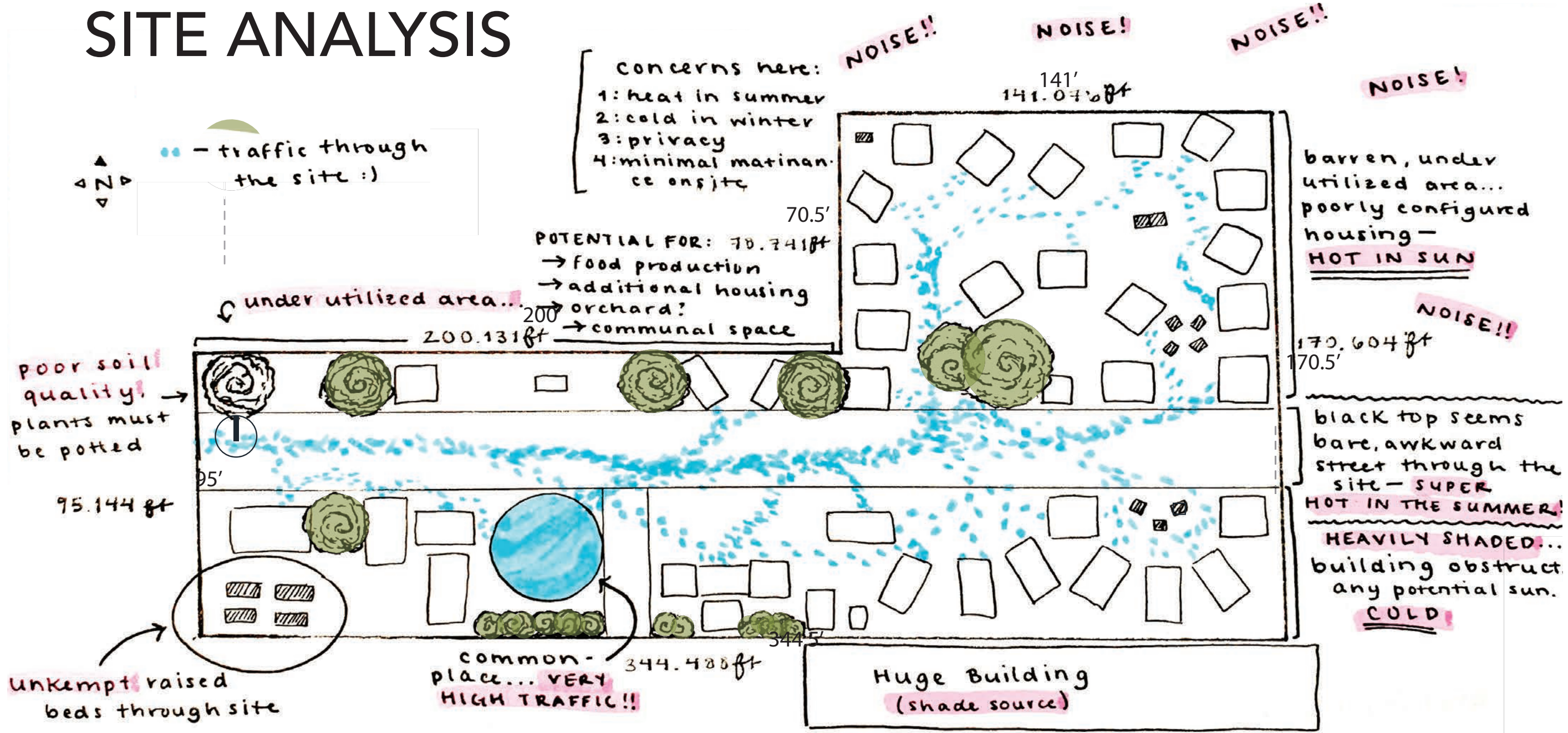
Wheels attached to bottom



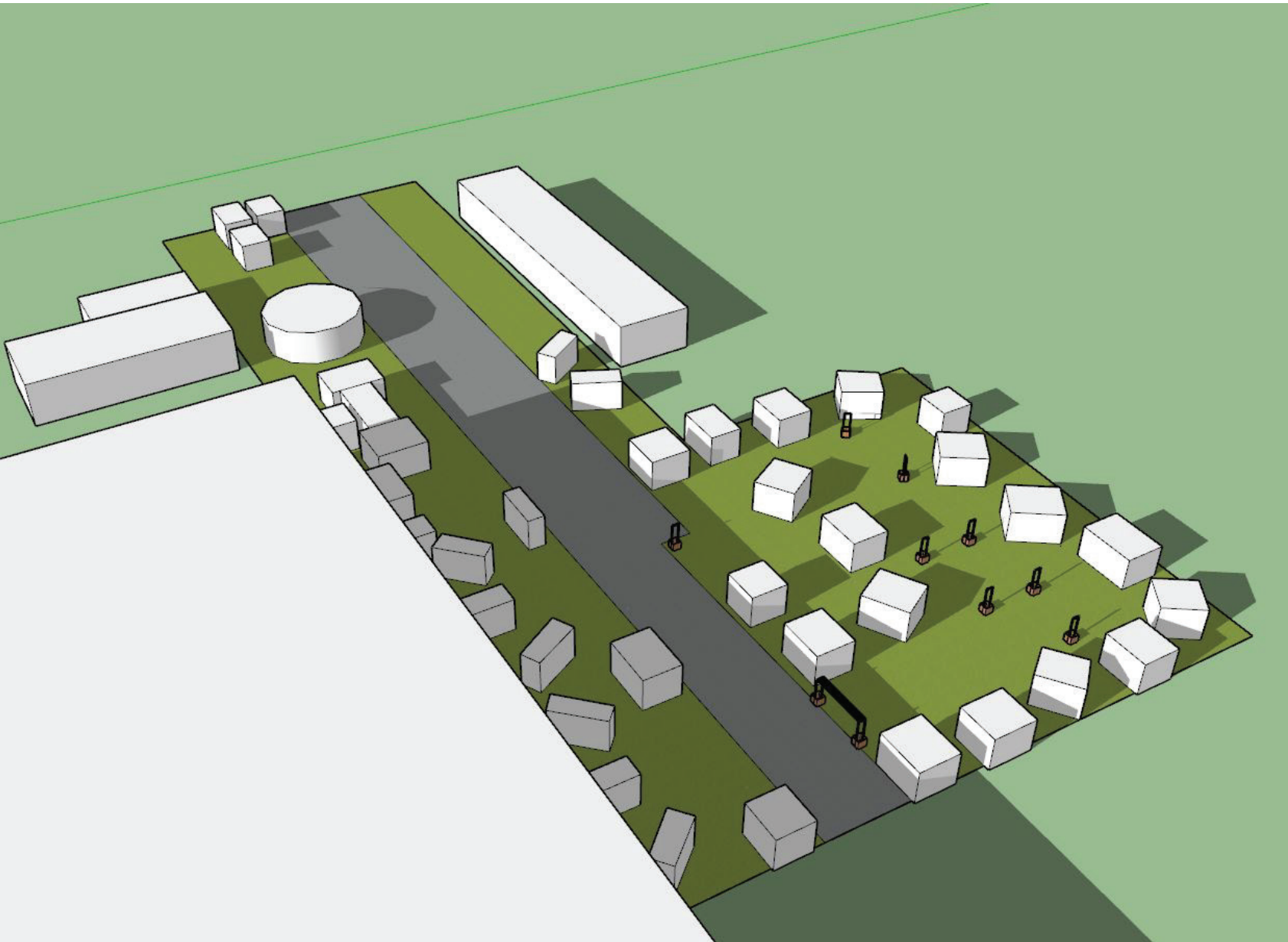
GOALS:

- COOLING
- PRIVACY
- FOOD PRODUCTION
- CUSTOMIZATION

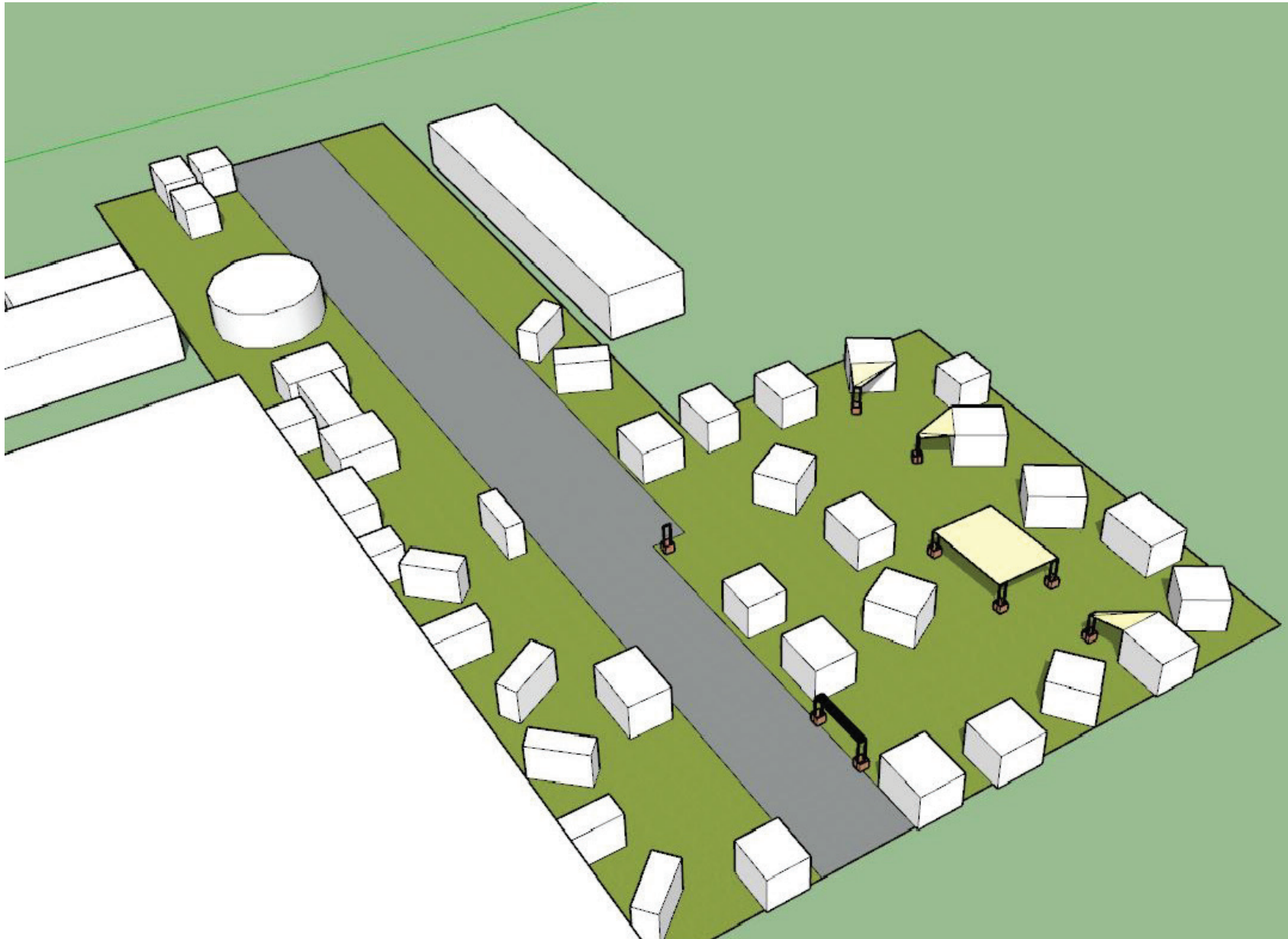
SITE ANALYSIS



SITE PROPOSAL

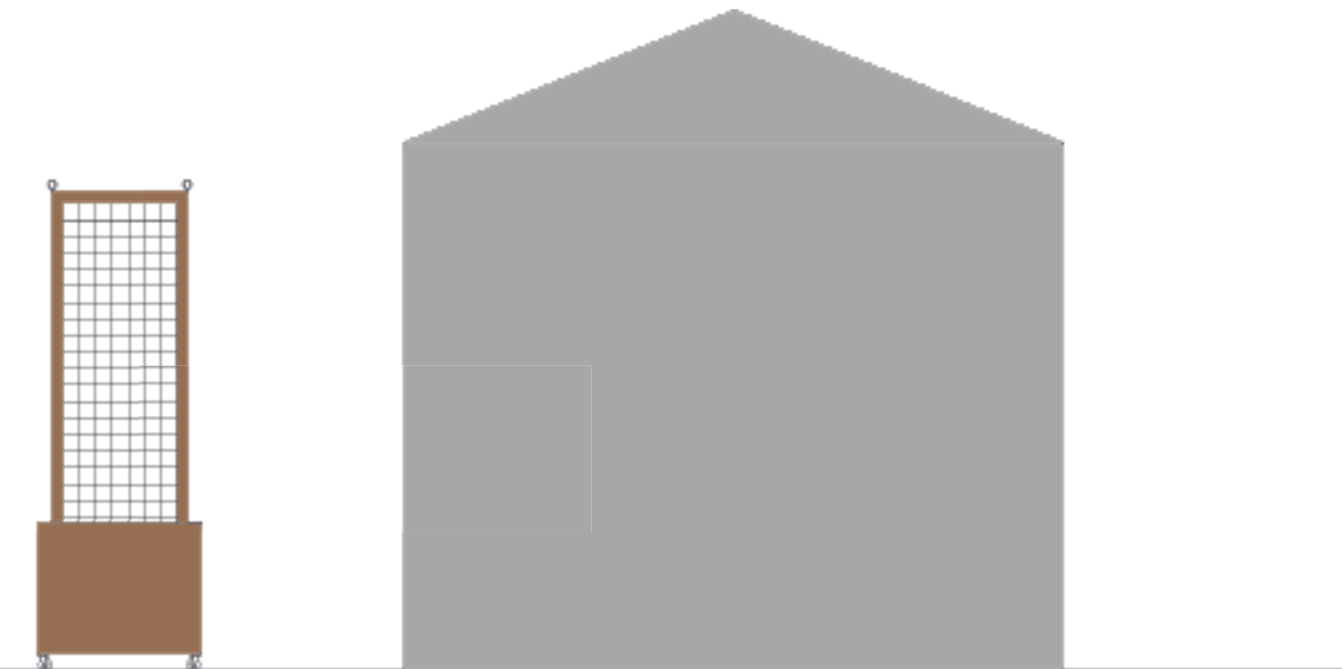


OVE during the winter solstice with our design

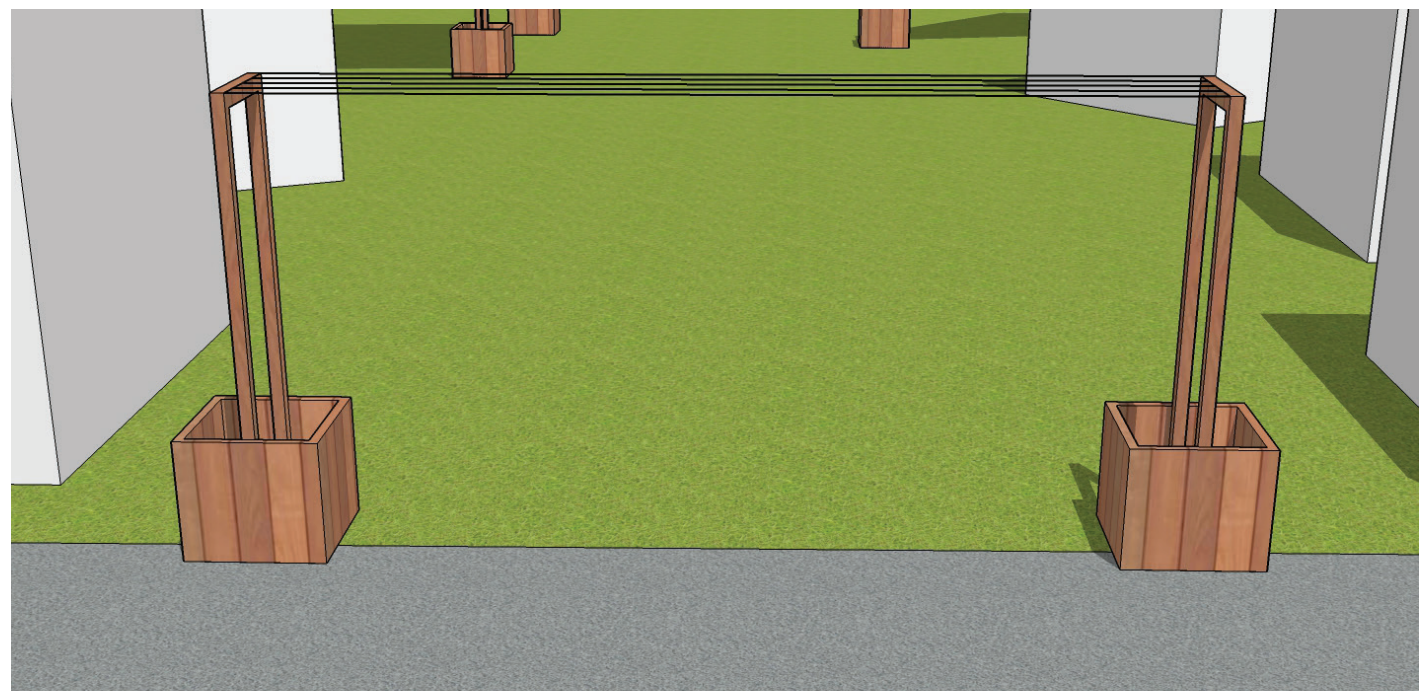


OVE during the summer solstice with our design

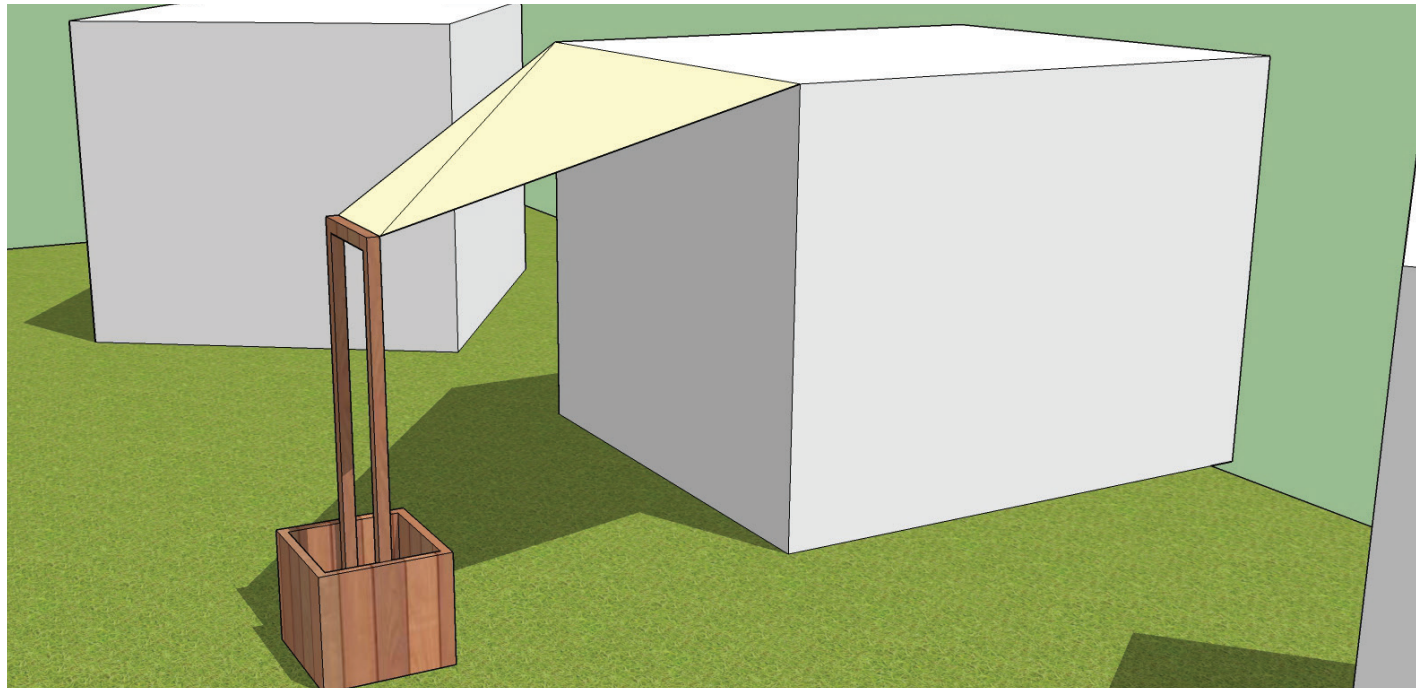
FOUR CONFIGURATIONS:



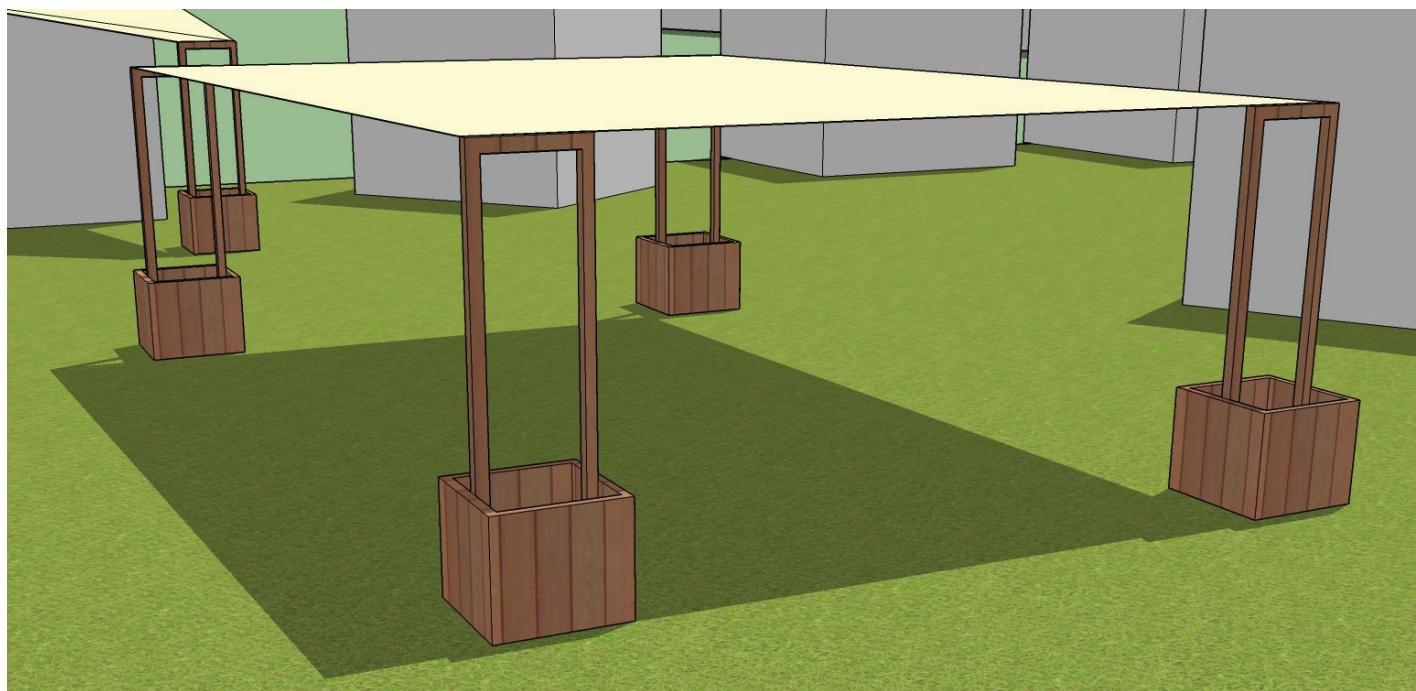
1) **SINGLE TRELLIS:** can support edible climbing plants and can fit in small spaces.



3) **TWO CONNECTED** with wires to give more space to grow edible plants like grapes or kiwi vines.



2) **SUPPORTED AWNING:** Trellises can support a simple canvas awning to cool the tiny houses and be quickly attached and detached

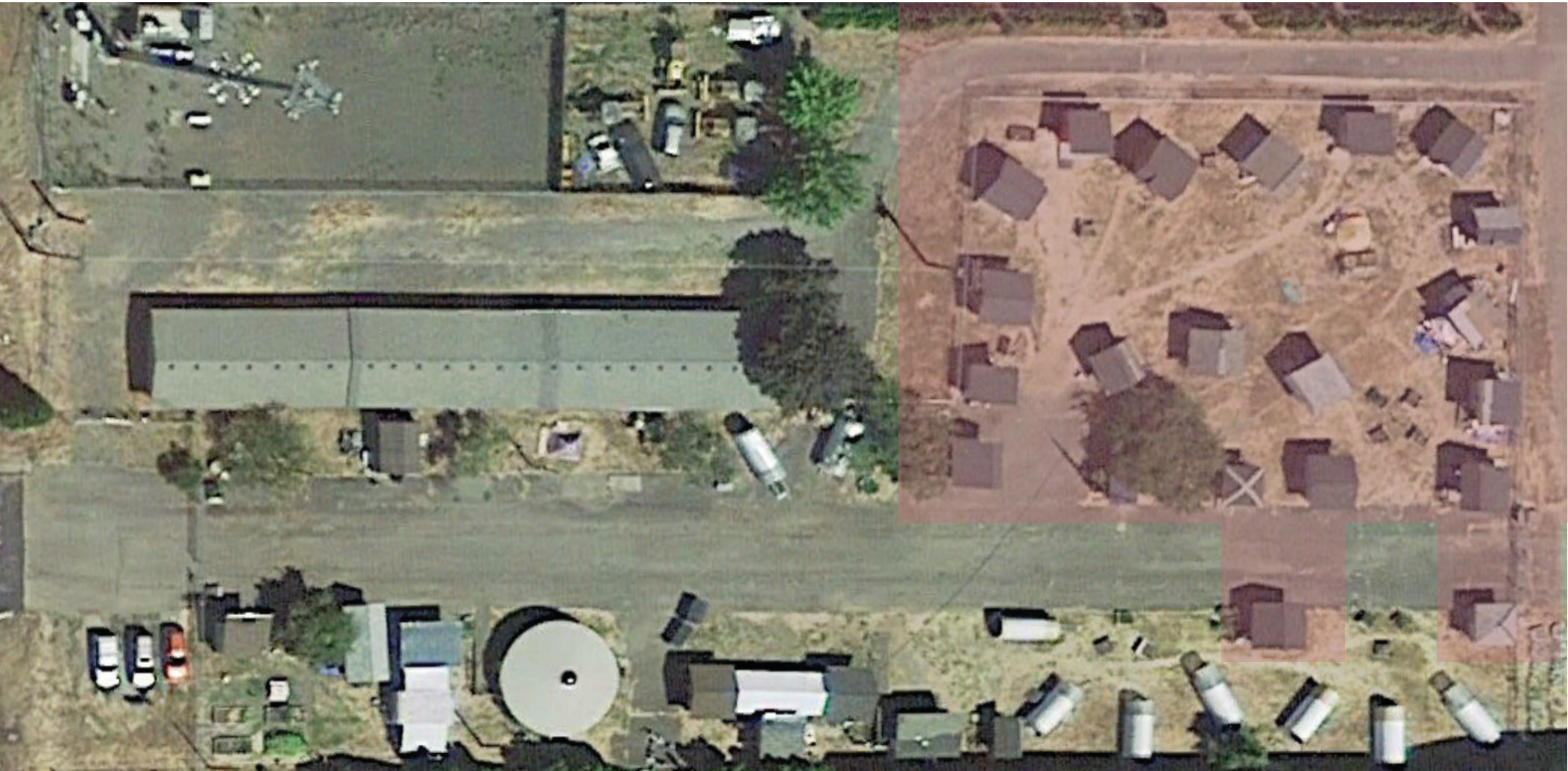


4) **TENT** can support a shade structure for outdoor living or event space

Knot Your Average Window

Bianca Malkoc, Alissa Brunkhorst, and Kellie Murtle

The residents at Opportunity Village mentioned that the winter time can be hard because heat is easily lost, especially when they open their doors. We also learned that a lot of **heat can be lost through windows** so we wanted to create things to help reduce the amount of heat lost through windows. We also wanted our designs to be **universal for the winter and summer** so our concepts can be used to help create shade in the summertime. Another goal is to use **found or low cost materials**. These designs can also be **customizable** and don't require professionals to make or install.



The area where we are focused are mainly the tiny homes that have windows. Although, the knots and patterns can be used for the other places but maybe not as a window cover.



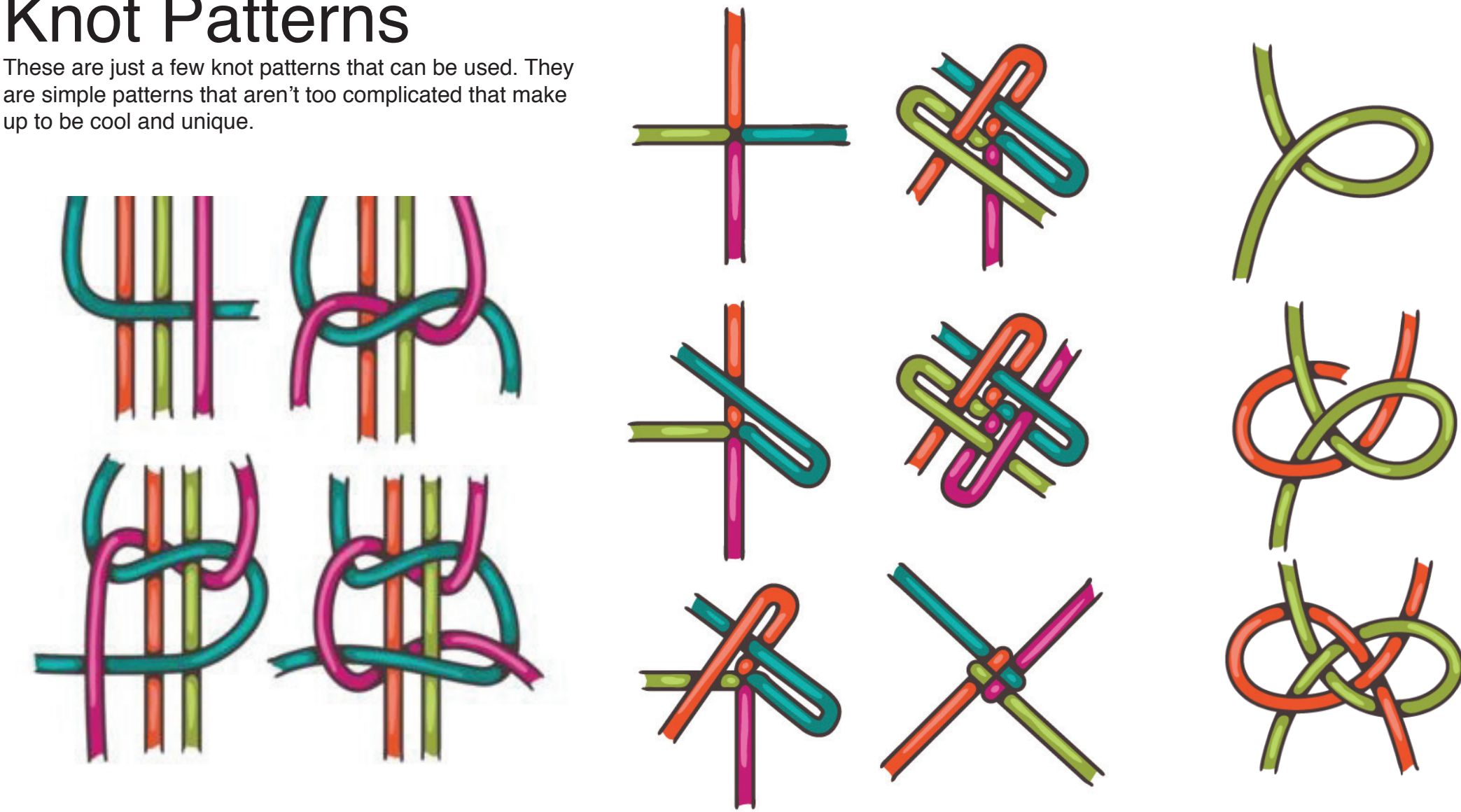
Because these are knots, they are **adjustable** and can be moved around to allow more or less light in.



Different materials can be used. This could be an option in the wintertime to let light in then slide them back together to retain the heat when the sun goes down.

Knot Patterns

These are just a few knot patterns that can be used. They are simple patterns that aren't too complicated that make up to be cool and unique.



Square Knot

Chinese Crown Knot

Josephine Knot

Materials



Cost: Can be free if you have any old ripped out jeans or can be found at Places like Goodwill for about \$4.00 to \$8.00.

Jeans are also a good material to have for denser knots to block cold from coming in.



Cost: Can be free if you have any old ripped out t-shirts you can't wear anymore but can be found at Goodwill for about \$3.00 to \$4.00.

T-shirts are also a good material to have for denser knots to block cold from coming in.



Cost: \$4.50 for 100 feet of 550 para-cord on Para-cord Wholesale.

Para-cord can be used to have denser knots and can be un-knotted to be used for other thing if needed.



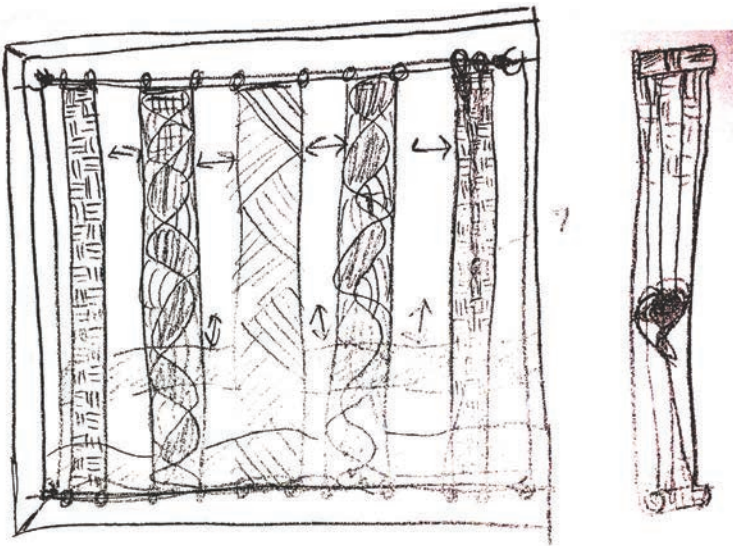
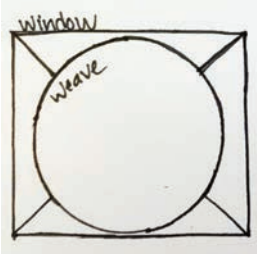
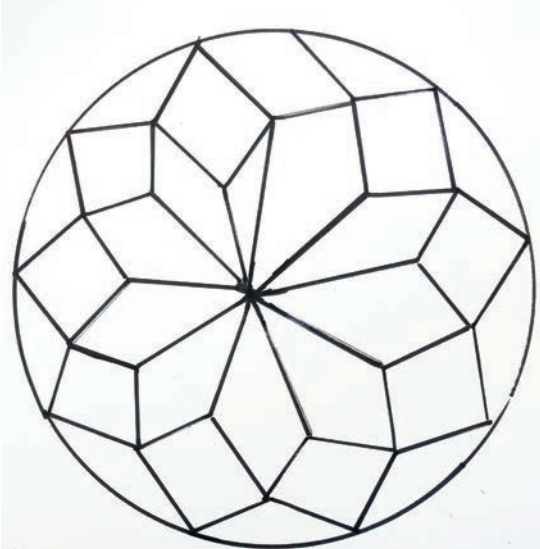
Cost: \$24.00 for 5,000 feet of three ply twine from ULINE.

Twine isn't as thick as the other options but makes nice looking knots. This could be a good summer option to create dappled lighting in the summertime.

Precedent Studies/ Concepts

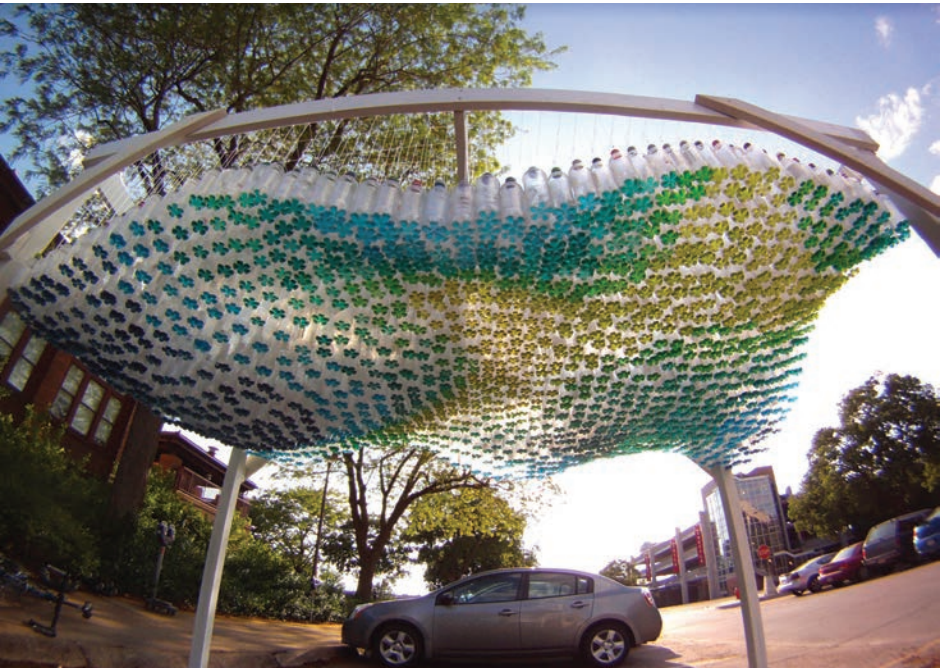
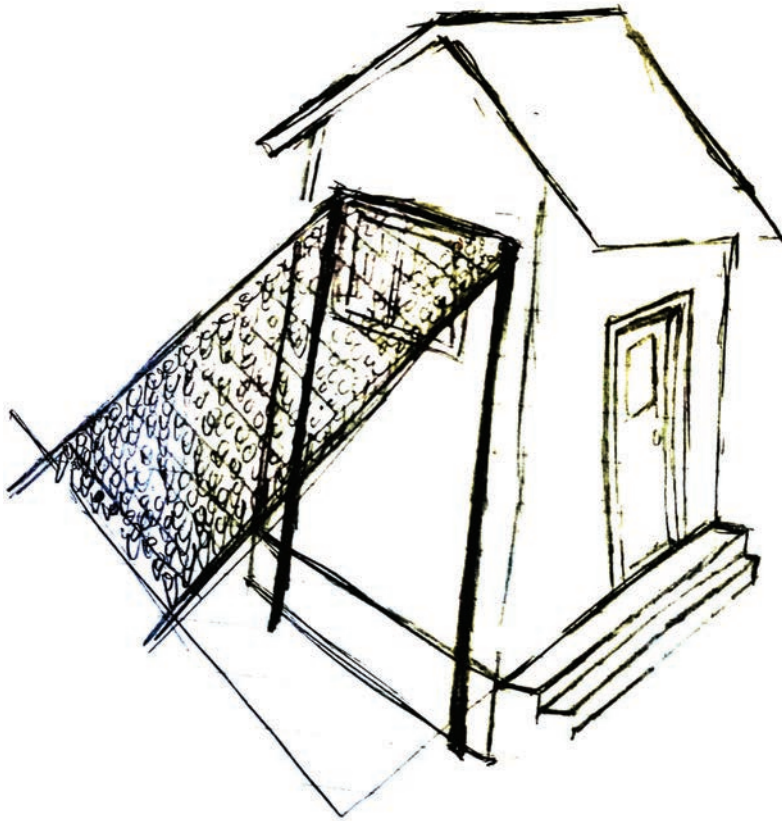
Dream-Catcher

Dream-Catchers can come in many sizes and patterns. They can be densely weaved or thinly weaved. There can be moving parts and the materials are **low cost**. Dream-Catchers are easy to create by anyone and can be work-shopped at Opportunity Village. **It is aesthetically pleasing and can be unique to each person**. Utilizing recycled materials, this project is inspired by the pattern of a dream-catcher. The material can be pulled tight in the center, creating less surface area and reducing the amount of air or light allowed through the space, or loosened to allow for more surface area and increased light and air allowed through. The concept can be hung in front of a window inside of the home, similar to curtains. The design differs from curtains as it **allows for thermal regulation by trapping air between the weave and the glass window, while still allowing in light**. Additionally during hot summers, and the weave can be scaled back to allow greater air flow.



Utilizing Found Material

Using recycled materials can help reduce cost and still be functional. Using things like plastic bags can be used to knot and weave. You can use recycled, found, and inexpensive materials to create a unique **macramé window insulation**. The idea is to make strips of macramé so the individual can add or change their window insulation as they would like. In the winter, it can help **reduce heat loss** through windows and in the summer it can help **shade** and keep the inside **cool**.

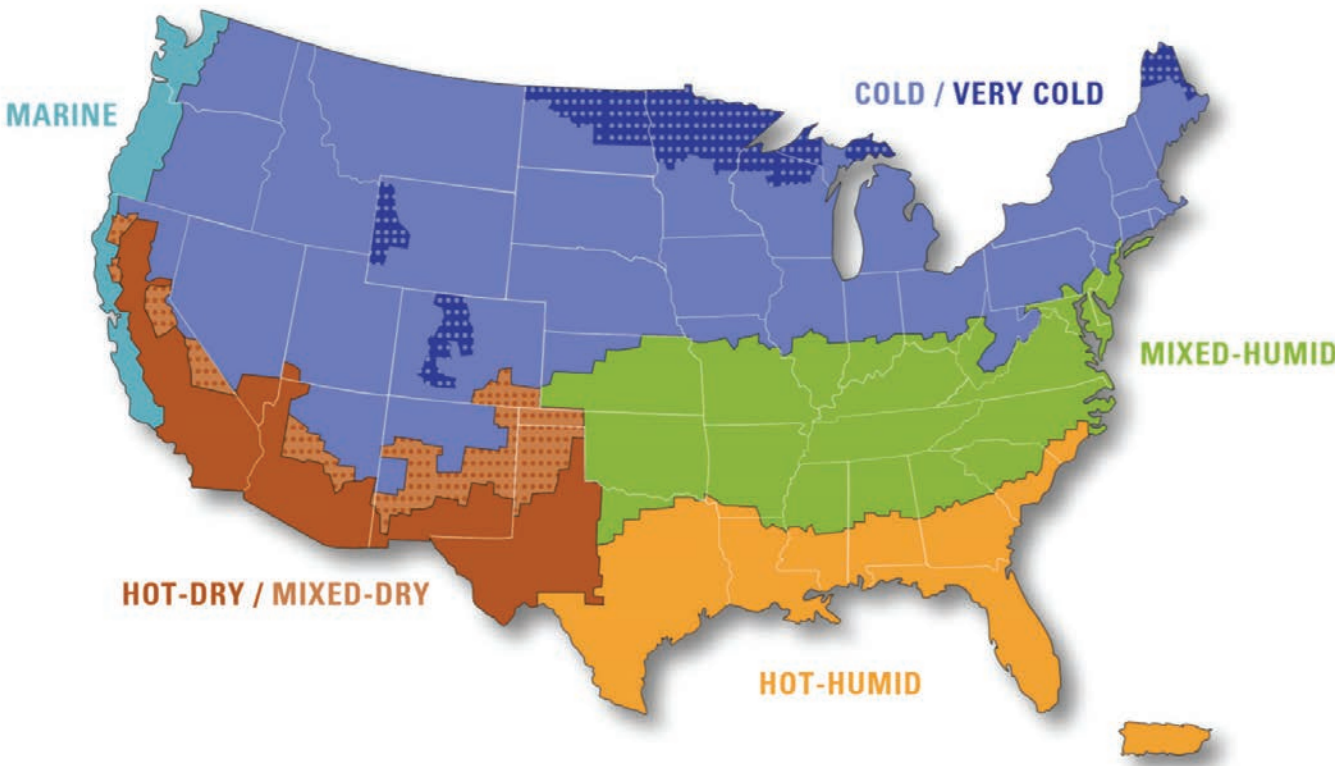
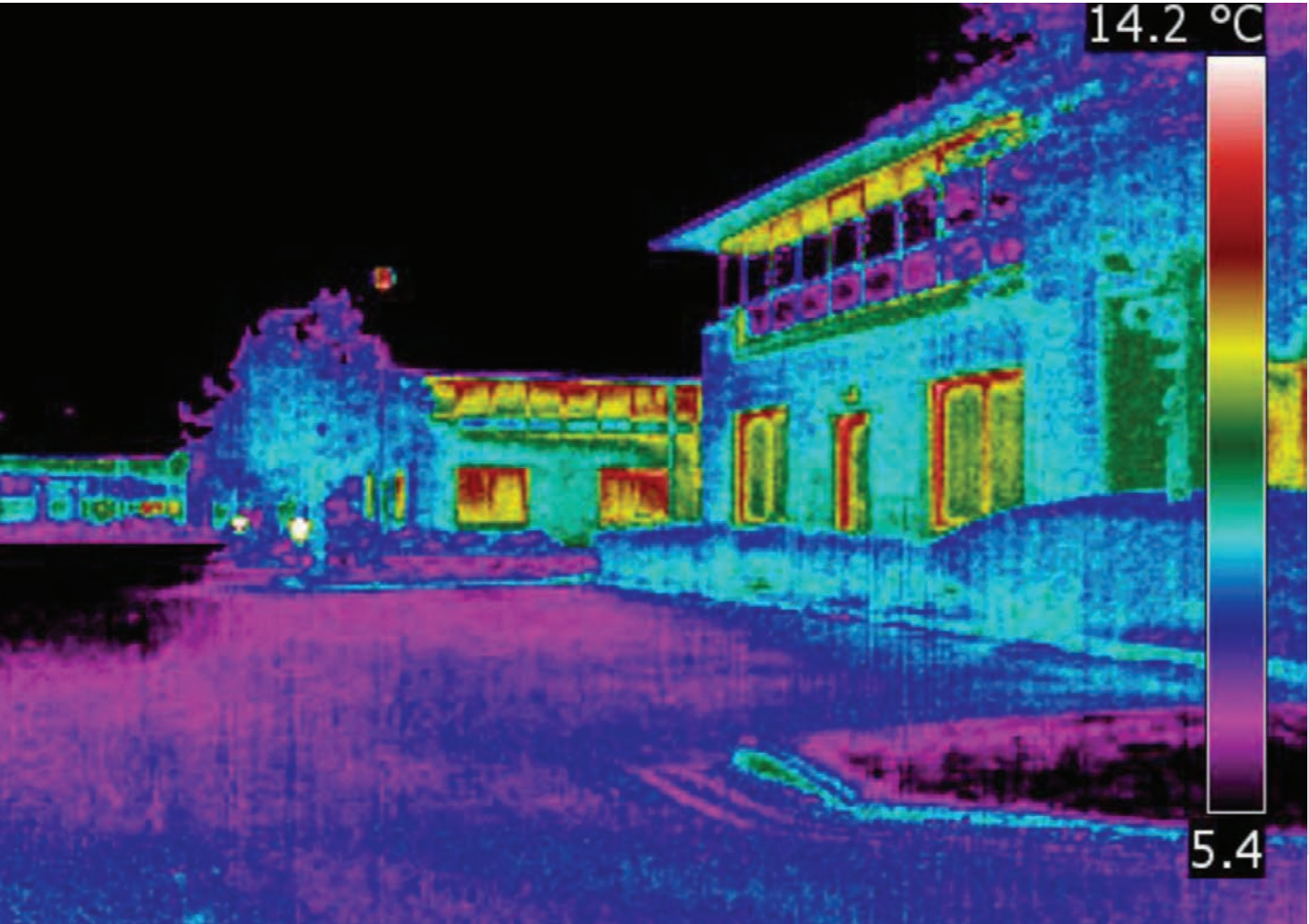


(POP)culture Insulation by Garth Britzman

The goal of this installation would be **noise reduction** in addition to creating **shaded outdoor** communal spaces for the warmer months through a constructed canopy. My design focuses on **passive colling** inspired by Britzman's (POP) culture installation. It is designed to be attached outside to the window, casting shade onto the window and the ground underneath. This can also create another **private space** underneath the canopy, which will help residents to feel more at home while in transitional housing.

Opportunity Village

Opportunity Village is a community that sits on city property that is rented to them for \$1.00 a year. The homes on this site are intended to be "short term" so they are built on stilts so they can be quickly removed if needed. There is no water or electricity running through the homes but their community center has electricity and there is running water in the bath house. This community has about 35 people living there now but the community can have up to 39 residence. The average length residence stay are 1-3 years. The winters here in Eugen, Oregon can get cold so keeping these tiny homes warm can be difficult. There are also studies done showing that a lot of heat in homes are lost through windows.



Building America climate zones, 2015, U.S. DOE

Showers to Shade:

On-site resource recovery for nursery stock

LA 459/559 S.E.L. Yekang
Yun-Han Huang, Coner Iverson, Adam DeHeer

Problems

- Too Hot
- No Trees
- No Income
- High EWEB Bill
- Limited Training

Opportunities

- Labor
- Space
- Waste liquids
- Graywater
- Urine

Precedent

Sanitary Greenspace is a on-site resource recovery system used to grow container plants. In 2018 the first prototypes were launched in the informal settlements of Lima Peru.

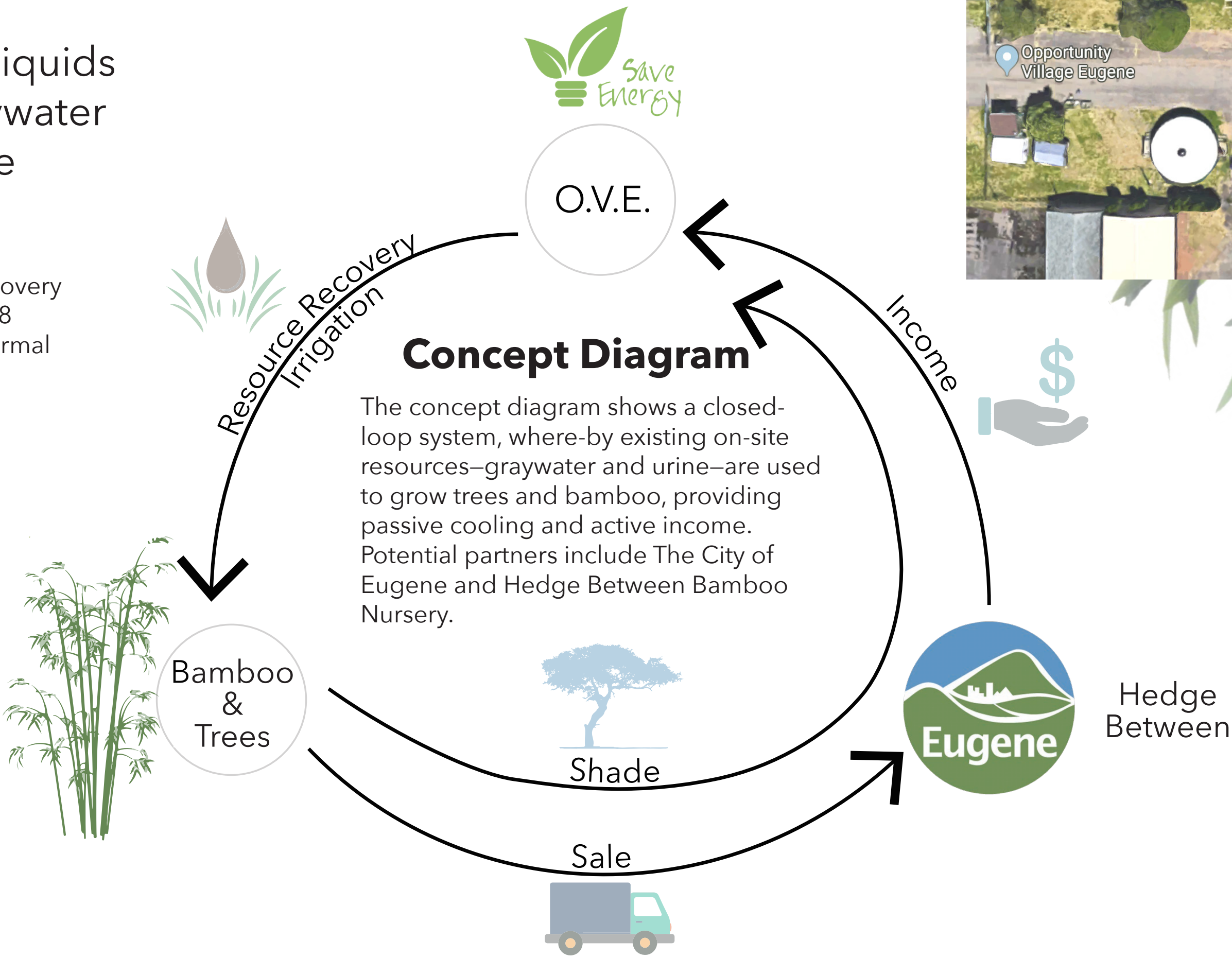


Site Analysis

Using Google Maps, we identified the best locations for providing shade to the dwellings.

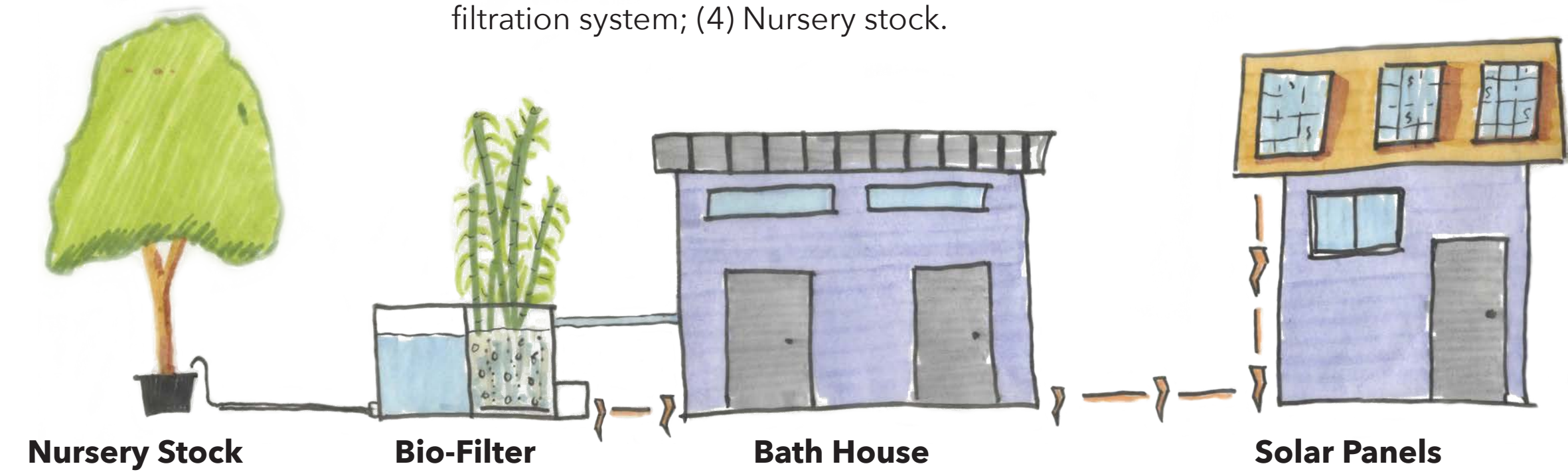
Legend

- Shaded Areas
- Ideal Tree Locations



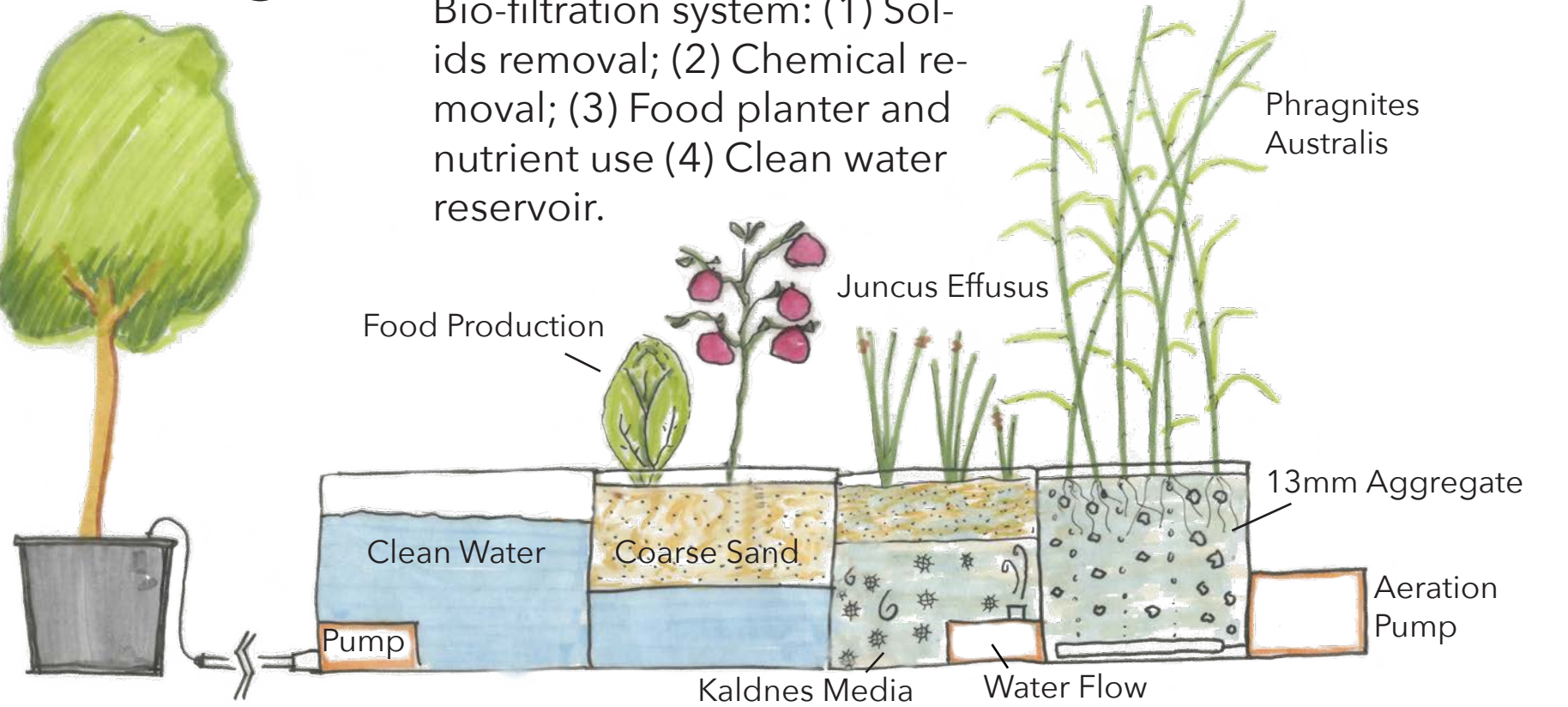
System Diagram

The covncept diagram shows The larger system consists of a four parts: (1) Photovoltaic Solar Panel; (2) Greywater and Urine from bathhouse; (3) Bio-filtration system; (4) Nursery stock.



Filter Diagram

There are 4 parts in the Bio-filtration system: (1) Sol-ids removal; (2) Chemical removal; (3) Food planter and nutrient use (4) Clean water reservoir.



Site Plan

The water treatment tanks are located next to the bathhouse. The site plan also illustrates the irrigation layout. Three phases show the potential of the project.

Phase 1



Phase 2



Phase 3



View of OVE Bamboo Nursery



FLUX GARDEN @ OVE

SITE SPECS:

- 30 tiny home units (50 square feet)
- Industrial Zone
- 70% of site have impermeable surfaces.
- Village houses up to 35 people at a time
- It has helped about 90 houseless people transition
- One communal space (Yurt)

CURRENT FOOD SYSTEM:

- A few garden beds in use
- Food Stamps
- Communal pantry
- Communal kitchen
- Diverse food and cooking experience

OBSTACLES:

- Constant influx of people
- Trust
- Limited water sources
- Very hot and dry in Summer
- Only one communal space
- Planting in soil is not allowed

FOOD SOVEREIGNTY / A LIFESTYLE

WHAT IS FOOD SOVEREIGNTY?

Food sovereignty is the right of peoples to define their own food and agriculture; to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives; to determine the extent to which they want to be self reliant; to restrict the dumping of products in their markets; and to provide local fisheries-based communities the priority in managing the use of and the rights to aquatic resources. Food sovereignty does not negate trade, but rather, it promotes the formulation of trade policies and practices that serve the rights of peoples to safe, healthy and ecologically sustainable production.

FOOD SOVEREIGNTY @ OVE

The goal of Flux Gardens is to bring food sovereignty to Opportunity Village through the use of adaptive, mobile container planters that can be tailored to the changing needs of the residents. The addition of shade screens, fruit trees and potted bamboo will help regulate heat and provide shade that will allow residents the opportunity to grow, cook and enjoy their food in a way that has not yet been possible at this site. The ability to grow fresh produce will give the community the chance to take control of their food intake as well as learn a set of new, valuable skills. We hope that this format will evoke a sense of independence, self reliance and an appreciation for the stability and upward mobility that Opportunity Village provides.



Shrubs, fruit trees, potted bamboo, vining plants and other lush greenery will offer shading and breeze to the hottest areas around the edges of the property. Not only will these elements offer relief from intense summer heat, but they will also bring privacy and aesthetic value to the space.



Trees and fruit trees will be placed throughout the village to provide fruit for consumption within the village and to sell to the community during the Summer and Fall. placing more trees in the bungalow area to provide shade and privacy between homes.



Small, durable containers (such as milk crates and things of the like) will offer adaptive, mobile design of garden beds and new spaces which will allow residents to curate menu gardens in common areas and bring more personalization near their individual residences.



Shade tarps offer immediate shade and shelter with how easy they are to construct. This can provide additional communal spaces within the village that provide shade in the Summer. The posts of the Structure can vary from hydroponic pillars to regular wooden posts. Either way, these shade structures offer modularity and flexibility as the village grows and changes.



Menus offer an easy way to access and grow food. the different colored containers will indicate if its a soup, salad, or herb garden. the herb and salad garden will be located where the current garden beds exists by the entrance for more communal gardening. the other containers will be placed around the bungalows for a more personalized experience.

POSSIBLE VEGETABLES AND FRUIT:

- Salad:** lettuce, arugula, chard, mustard greens, broccoli, leeks, kale, peas
- Soup:** squash, tomato, carrots, potatoes, onion
- Herb:** mint, rosemary, thyme, chives, oregano, cilantro, basil, parsely
- Fruit:** apples, pears, plums, figs, strawberries, grapes

PERIMETER

TREES

CONTAINERS

SHADE TARPS

MENUS



- A. FRONT DESK/ADMIN
- B. STORAGE
- C. BIKE PARKING
- D. MICRO-BUSINESSES
- E. WORK SPACE
- F. GREENHOUSE
- G. COVERED GATHERING AREA
- H. DUMPSTERS/COMPOST

- I. INDOOR/OUTDOOR KITCHEN
- J. DINING AREA
- K. COMMUNITY SUPPORT
- L. RESTROOM/SHOWER
- M. RAISED GARDEN BEDS
- N. CONESTOGA HUTS
- O. BUNGALOWS



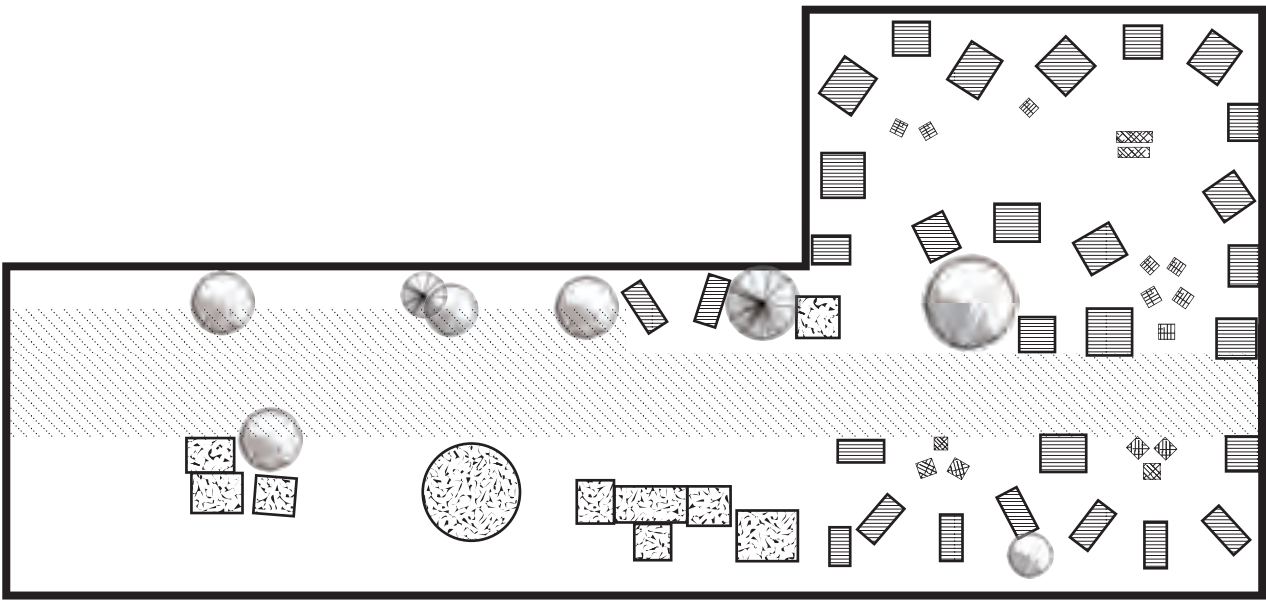
EDIBLE HARMONY

PAIGE HARRIS
LA 410 FOOD SYSTEMS

SITE



THE CURRENT STATE OPPROTUNITY VILLAGE HAS A LARGE LANE SEPARATING THE HOMES FOUND AT THE NORTH AND SOUTH ENDS. THE COMMUNITY MEMBERS HAVE EXPRESSED THEIR INTEREST IN AN EXPANDED GARDENING SYSTEM. I BELIEVE HAVING THE GARDEN AS A CENTRAL ASPECT WILL CONNECT THE SITE MORE AND ALLOW FOR ALL MEMBERS TO HAVE ACCESS TO HEALTHY AND ORGANIC FOOD.



SCALE: 1" = 50' - 0"



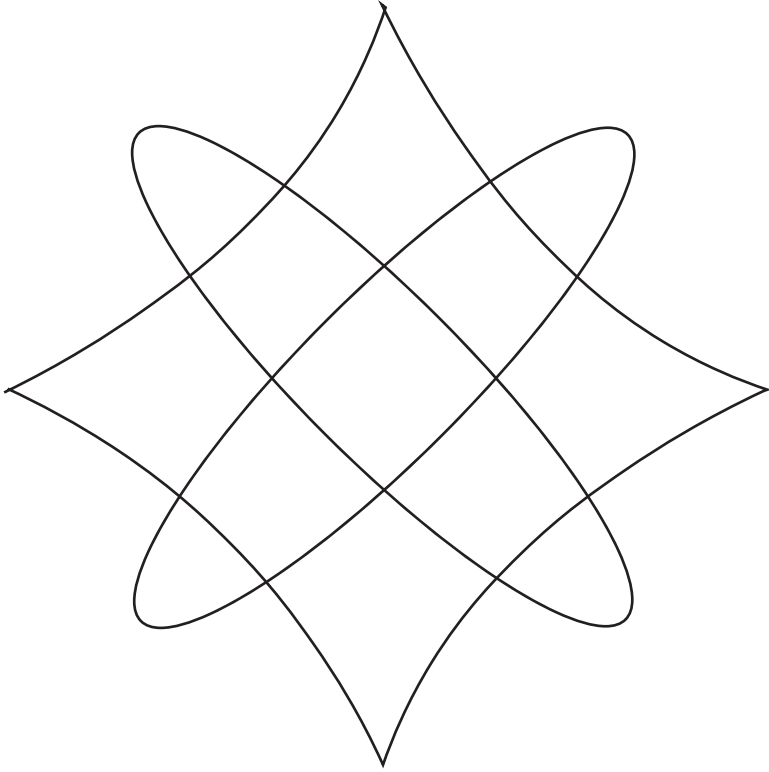
PRECEDENT



PRINZESSINNENGARTEN
UND NOMADISCH GRUN
BERLIN, GERMANY

THIS SITE IS SITUATED IN THE CENTER OF THE BUSY CITY OF BERLIN, GERMANY. EVERYTHING ASPECT FOUND HERE IS TRANSPORTABLE AS MOST CROPS ARE GROWN IN MILK CRATES, RAISED BEDS AND BURLAP SACS TO EMPHASIZE TEMPORARY LOCATION. ALL VEGETATION IS GROWN ABOVE GROUND IN RAISED CRATES OR BEDS AS THE CONDITION OF THE SOIL FOUND HERE IS NOT SUITABLE FOR GROWTH.

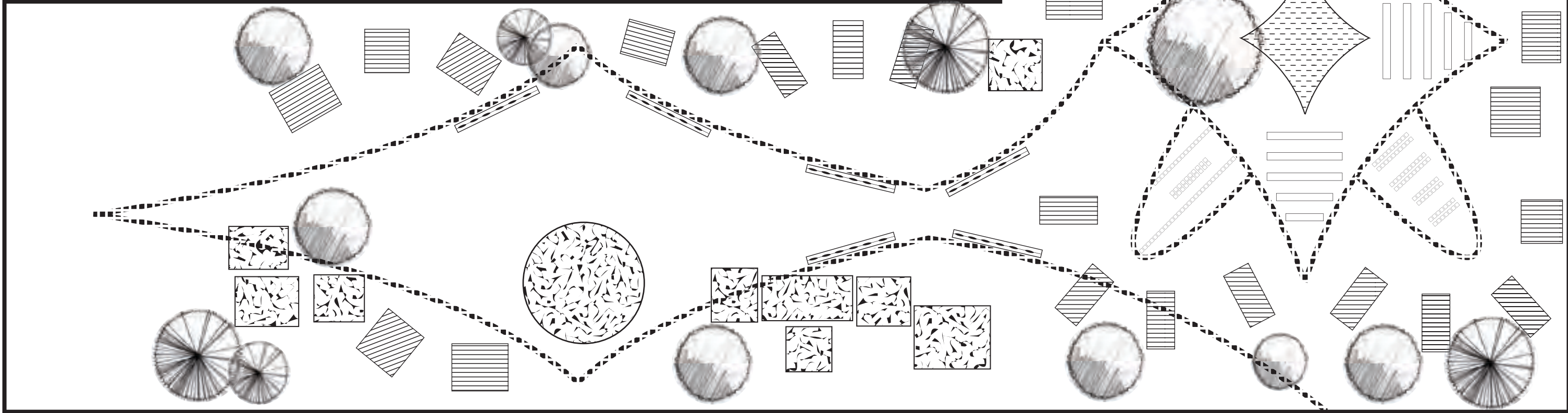
CONCEPT



THE CONCEPT OF 'UNITY' IS EXPRESSED AS AN IMPORTANT QUALITY IN OPPROTUNITY VIL-LAGE. USING A SYMBOL OF UNITY, THE NORTHERN KNOT, I CREATED A CENTRAL ZONE FOR GARDENING WITH THE HOMES SITUATED AROUND THE GARDEN. WITH VEGETATION BEING THE CENTRAL ASPECT, THIS WILL ALLOW FOR ALL COMMUNITY MEMBERS TO INTERACT WITH THE GARDEN AND BE INVOLVED IN SELF-SUSTAINABLE LIVING. THE GARDEN COMMUNITY CENTER WILL HELP MEMBERS GROW AND WASH FOOD AND WILL HAVE A LARGE TABLE FOR GATHERING. AROUND THE GARDEN CENTER WILL BE RAISED GARDEN BEDS, AND THE LOOPS AROUND THE HOMES WILL CONTAIN MILK CARTON PLANTERS THAT CAN BE REARRANGED BY OVE MEMBERS.

EASY-TO-GROW PLANTS

TOMATOES	CARROTS	BELL PEPPERS	SPINACH
RADISH	LETTUCE	GREEN BEANS	ONIONS
CUCUMBER	PEAS	BEANS	POTATOES
GARLIC	BEETS	ZUCCHINI	BASIL



LEGEND

RAISED GARDEN PLOTS	MILK CRATE PLANTERS	GARDEN COMMUNITY CENTER / TOOL SHED	VERTICAL PLANTERS	RIVER ROCK PATH OUTLINE

BENEFITS

MOBILE SUITABLE SOIL ACCESSIBLE	MOBILE OPEN DESIGN 12" x 12"	COMMUNITY TABLE GARDEN TOOLS SINK FOR HARVESTING	MOBILE DESIRED AESTHETIC CONNECTION	DESIGN AESTHETIC REINFORCING UNITY SUBTLE

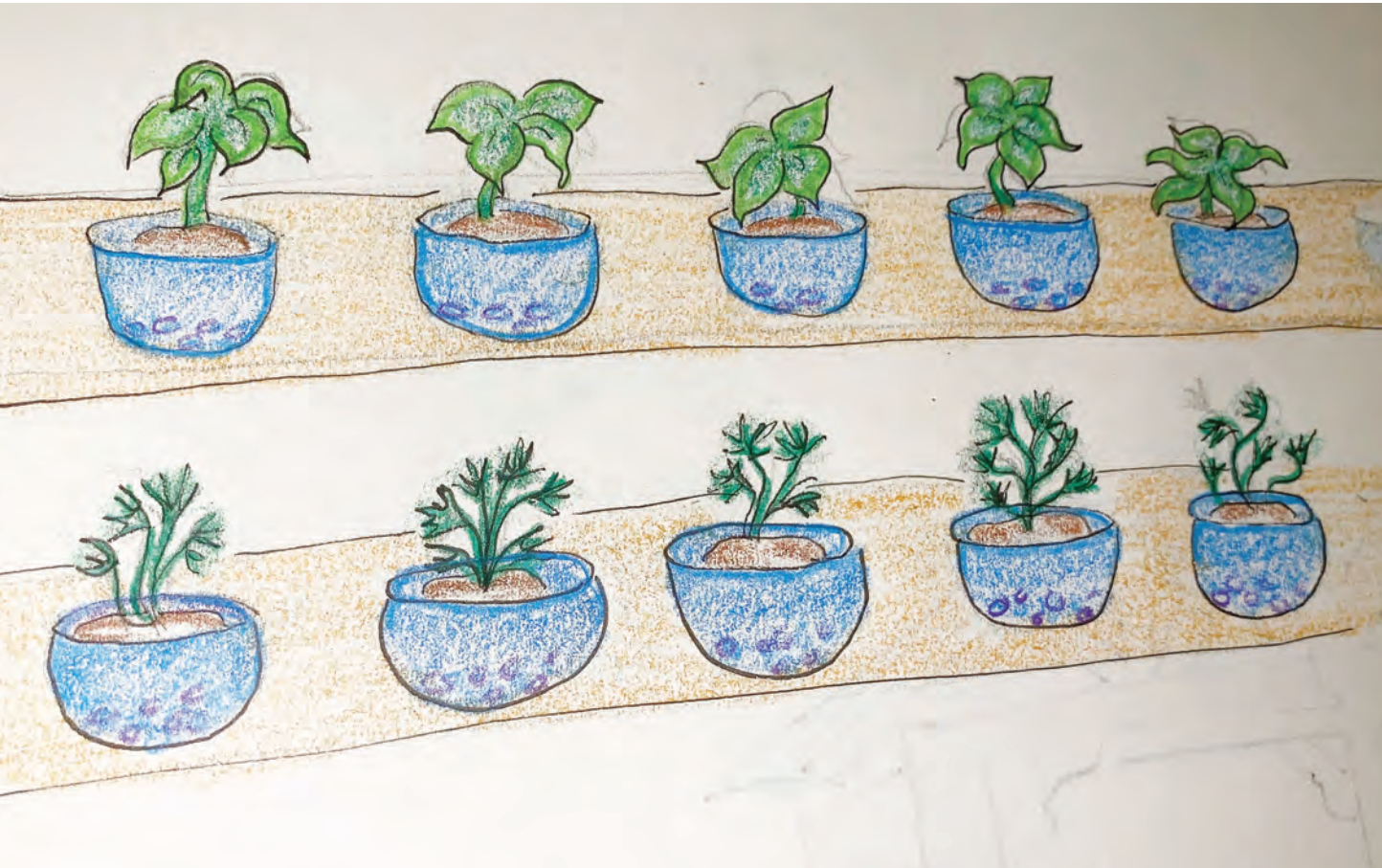
COST

\$100 EACH	DONATED OR \$4 EACH	ABOUT \$2,000	\$100 EACH	

Self-Sustaining Agriculture

Camille Hench and Kellie Murtle

The idea of our project is a combination of the pyramid gardens and the sky farms. The residents need shadier environments and would like the access to freshly grown herbs and vegetables. The residents are interested in “menu” gardens which are gardens that one could use all the ingredients grown in it to make soups, salads, and herbs. There would be multiple structures that grew different produce to accommodate these menu gardens. With pergola structures, potentially over the kitchen area, would have each side a different produce menu planted in pots. There could also be smaller structures that grow things like herbs and vines. There can also be PVC pipe added to these structures to help irrigate the plants.



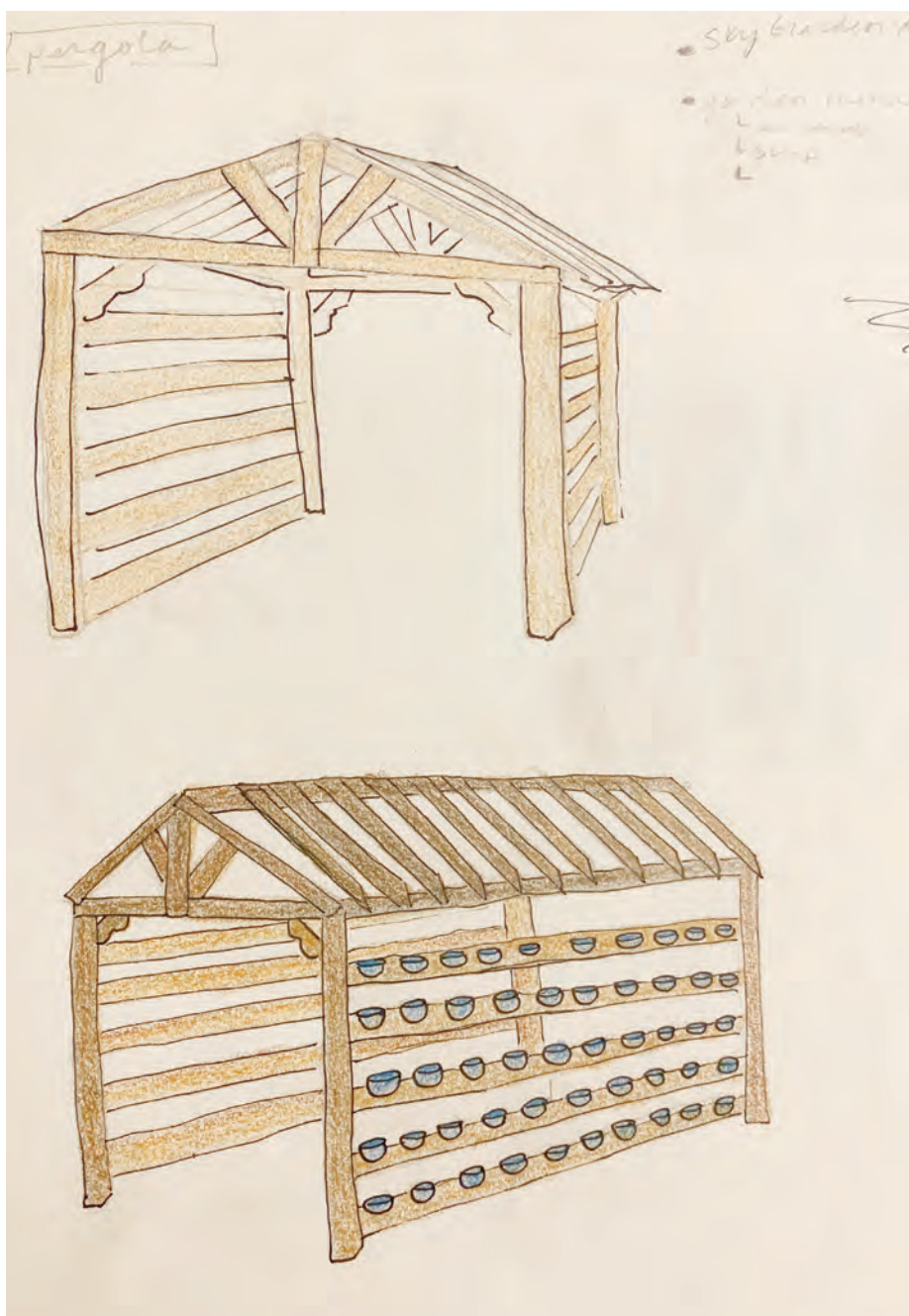
The red highlighted area is where the pergola is located. This one will have an irrigation system or drip line because it is closest to a water access.

The blue highlighted area will be the smaller structures that will have plants such as herbs.

Opportunity Village



Opportunity Village is a community that sits on city property that is rented to them for \$1.00 a year. The homes on this site are intended to be “short term” so they are built on stilts so they can be quickly removed if needed. There is no water or electricity running through the homes but their community center has electricity and there is running water in the bath house. This community has 35 people living there now but the community can have up to 39 residence. The average length of residence stay is 1-3 years. The residents are interested in having herb gardens or “menu” gardens around the community. They are also interested in the potential of shade structures along with these gardens.



	Fall	Winter	Spring	Summer
Phaseolus vulgaris				
Fragaria				
Rubus				
Pisum sativum				
Cucumis sativus				
Solanum Melongena				
Solanum lycopersicum				
Lactuca sativa				
Cucurbita				
Solanum tuberosum				
Spinacia oleracea				
Beta vulgaris				
Asparagus officinalis				
Brassica oleracea X italica				
Brassica oleracea X botrytis				
Pimpinella anisum				
Ocimum basilicum				
Nepeta cataria				
Matricaria chamomilla				
Allium schoenoprasum				
Foeniculum vulgare				
Lavandula				
Mentha				
Thymus vulgaris				



Material and Costs



2 x 4
2 x 4's are fairly inexpensive and can come in many sizes.
Cost: \$2.75 at Lowe's for 2 x 4 x 92



Seed Packets
Cost: On Amazon seeds cost anywhere from \$3.00 to \$4.00 but once the first year of growing is done you can harvest the seeds from plants for the following years



Pots
Potting plants could be recycled pop bottles but actual pots can be used.
Cost: On Amazon 100 plastic pots cost \$12.99. We could also ask plant nurseries if they have any they aren't using.

Precedents

Sky Farm- This project collects rainwater and is intended to grow vines. When the vines grow it produces shade. Sky Farms can be made fairly cheap and they are easily movable.

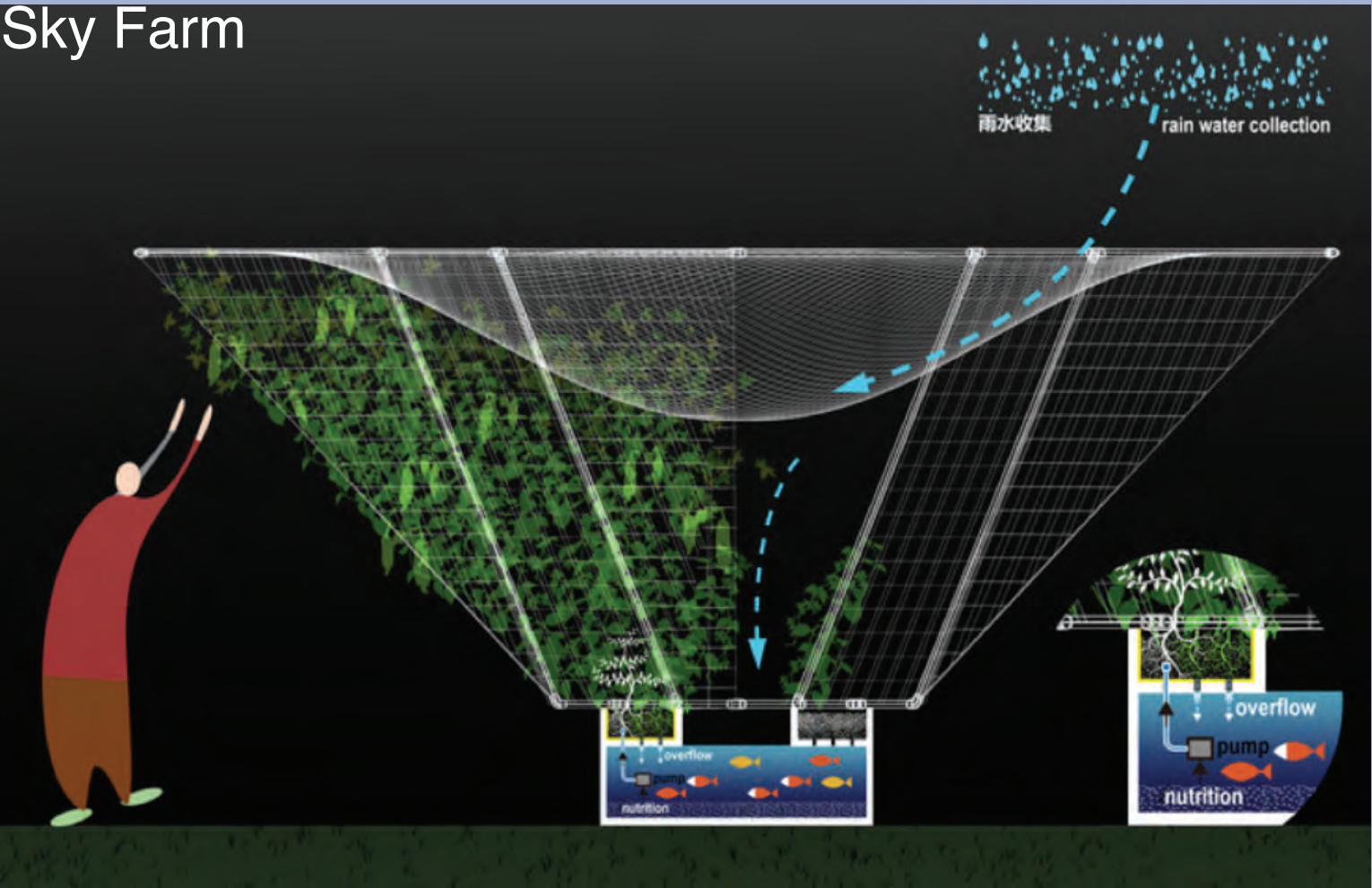
Pyramid Garden- This project is self-sustaining and doesn't require any soil. Pyramid Gardens also don't require lots of water which could be good for Opportunity Village.

Pergola- Pergolas are good at providing shade. Pergolas can also support vining plants which also helps create more shade.



Pyramid Garden

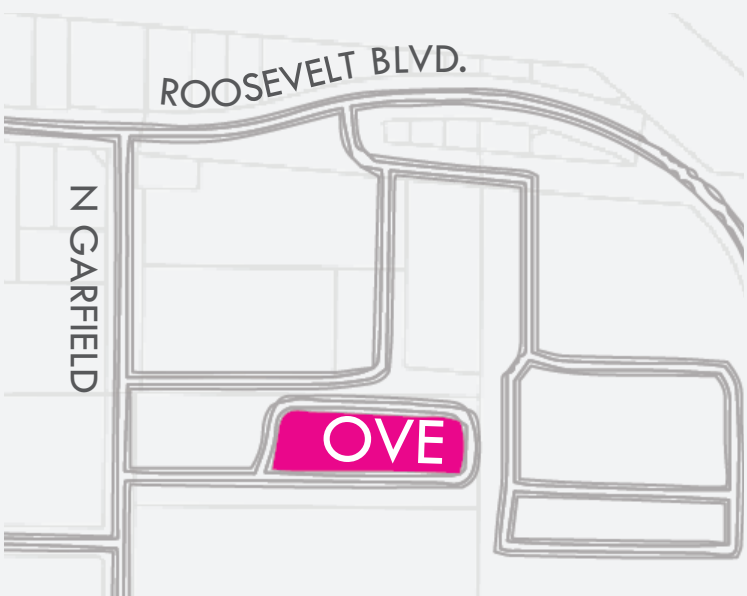
Sky Farm



Concept
IT TAKES A VILLAGE TO EAT

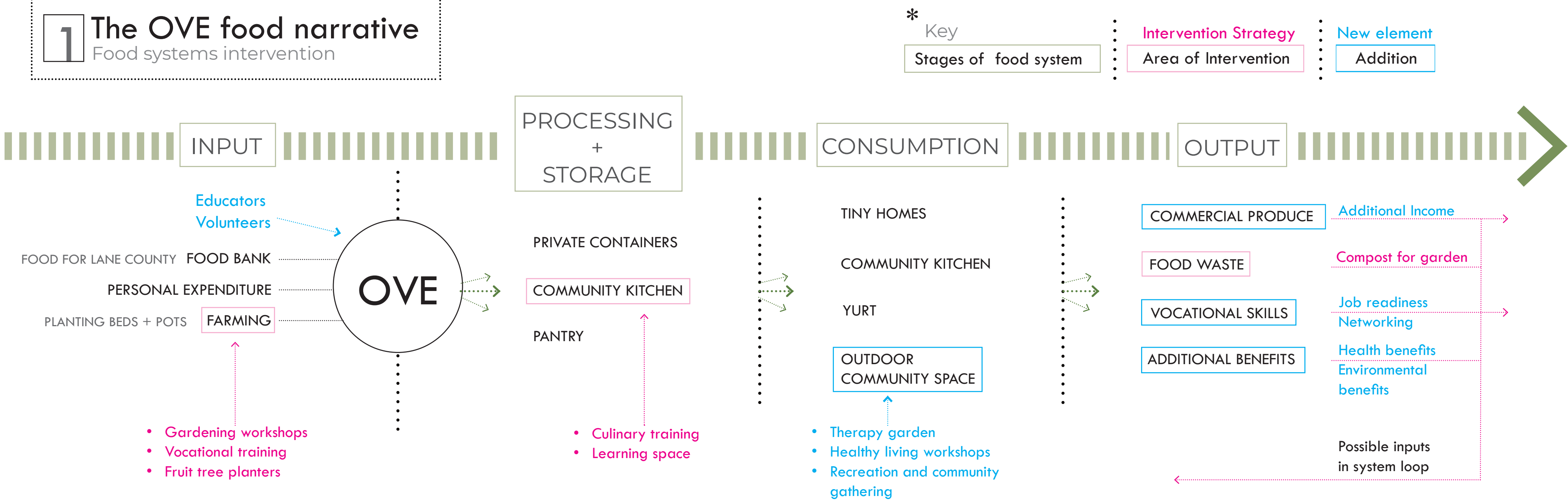
Empowerment through food systems
intervention at Opportunity Village Eugene

The Opportunity Village in Eugene provides the house-less with a safe space and the essentials to help with their transition. My proposal seeks to add to this effort and looks at the act of growing food as a strong avenue in doing so. ‘It takes a village to eat’ first, proposes interventions at the systems level. Here, urban agriculture is adopted as a lens not just to grow food but to provide multiple benefits - health, social, and economic. One such intervention is to provide translatable vocational training through farming. Another is to help residents cultivate a healthier understanding of and relationship with food through the act of farming. These interventions are then realized through site appropriate spatial expressions - Mobile fruit trees, community garden, vertical planters, etc.



- Low cost micro housing for the house-less
- Transitional stay for 35 people max
- 30 tiny houses - 80 Sq. Ft. each
- Average stay of 6 to 9 months
- Zoning for impermanent structures

1 The OVE food narrative
Food systems intervention



2 Village food network
Framework for agriculture

OVE food hub

The **community kitchen** is reimagined as a learning space. **Culinary training** on seed to table cooking using the produce from the gardens help residents gain **job skills** and learn about **healthy cooking methods**. This promotes positive connections with food, provides nutrition and can serve as a **creative outlet** for the community.



Orchard avenue



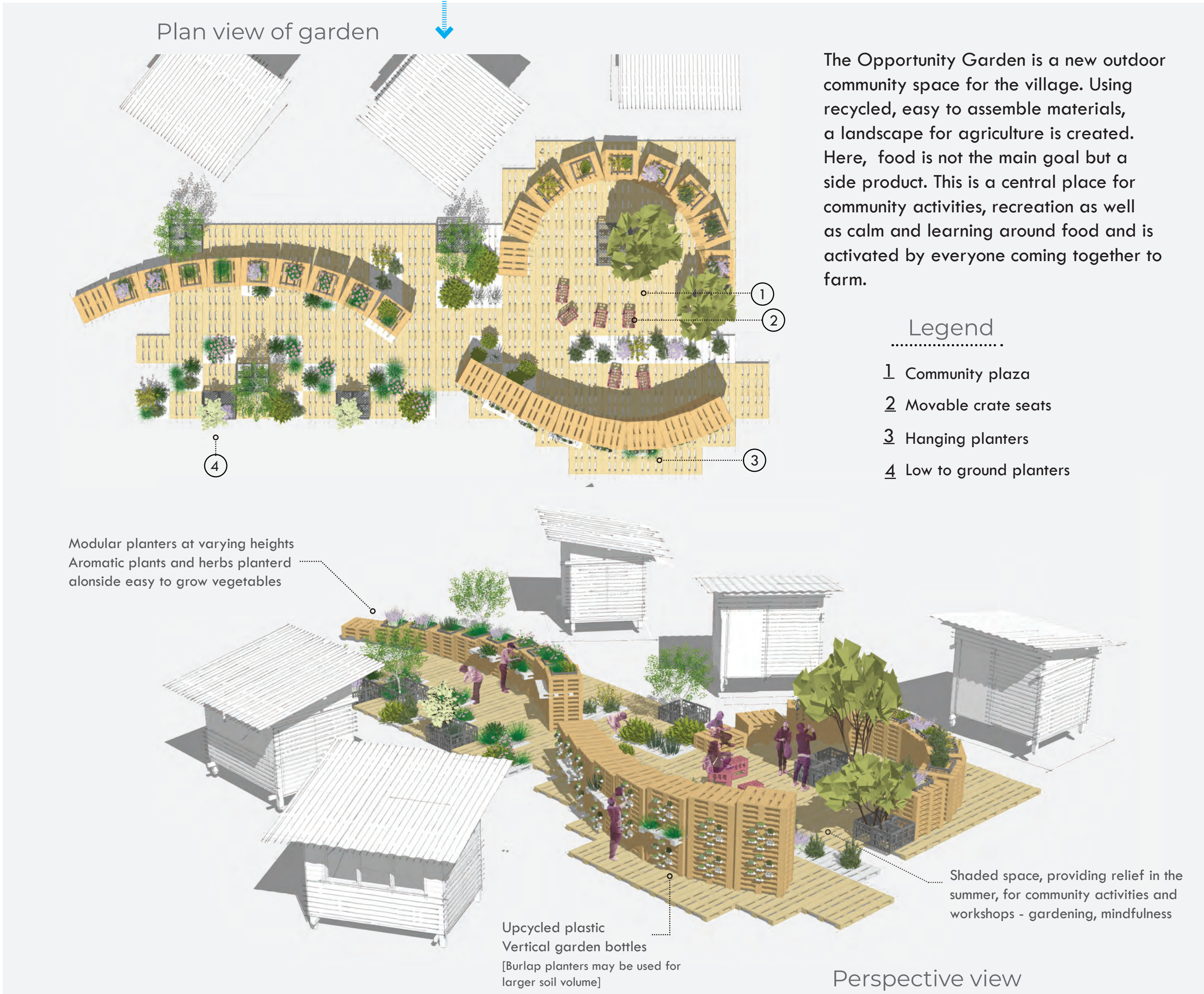
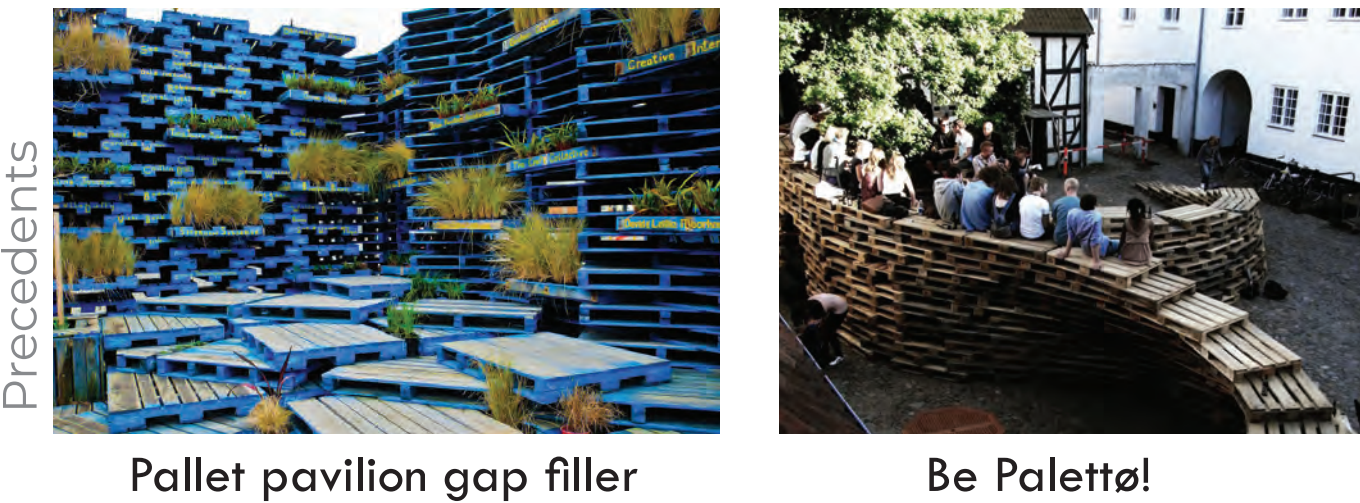
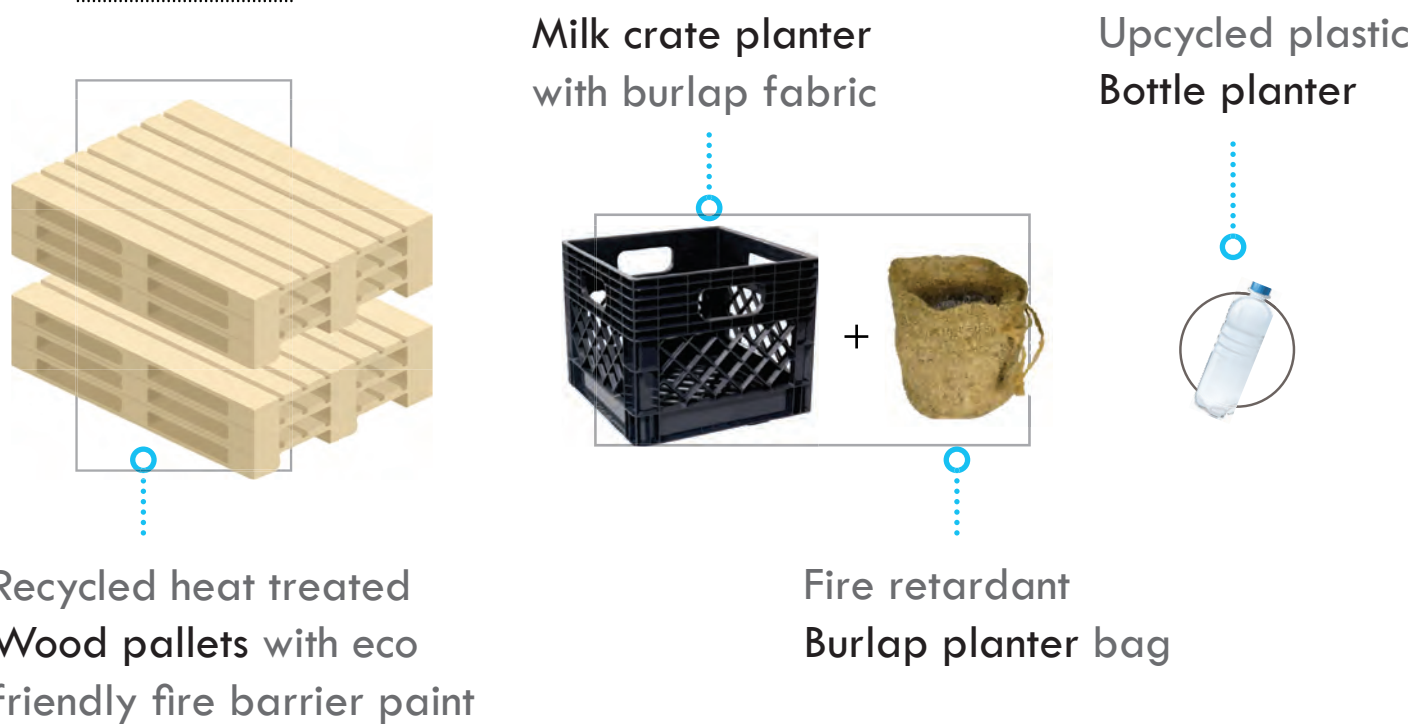
Small **fruit tree planters** are placed along the paved road, providing fruits as well as **shade and cooling**. Here compact and simple form **espaliers** may be planted, the gardening of which can be in the form of vocational training with potential **income** opportunities through sale. Here, the mobile planters provide impermanent containers with the necessary soil volume and quality

3 Opportunity garden
A new food space

Plants

- | | | |
|---------|---------------|----------|
| Beets | Huckleberries | *Mint |
| Carrots | *Rosemary | Chard |
| Lettuce | Sage | *Basil |
| Rhubarb | Thyme | Broccoli |
| Spinach | Parsley | |
| Cabbage | Strawberries | |
- *Water frequently
Small fruit trees and aromatic plants are also planted

Materials



O.V.F.

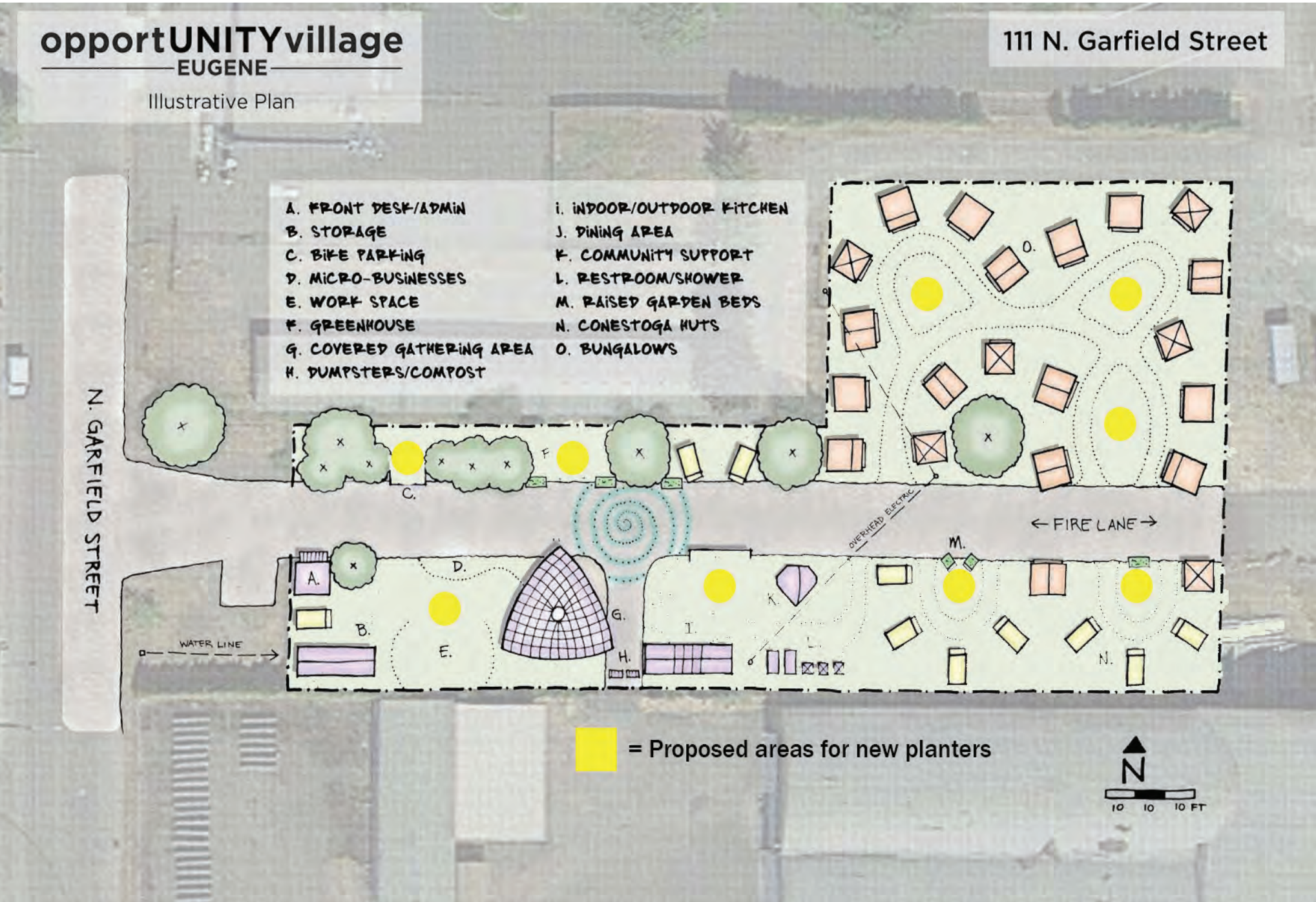
Opportunity Village Farm

Ayden Riley and Daniel Ramirez

Public Farm 1



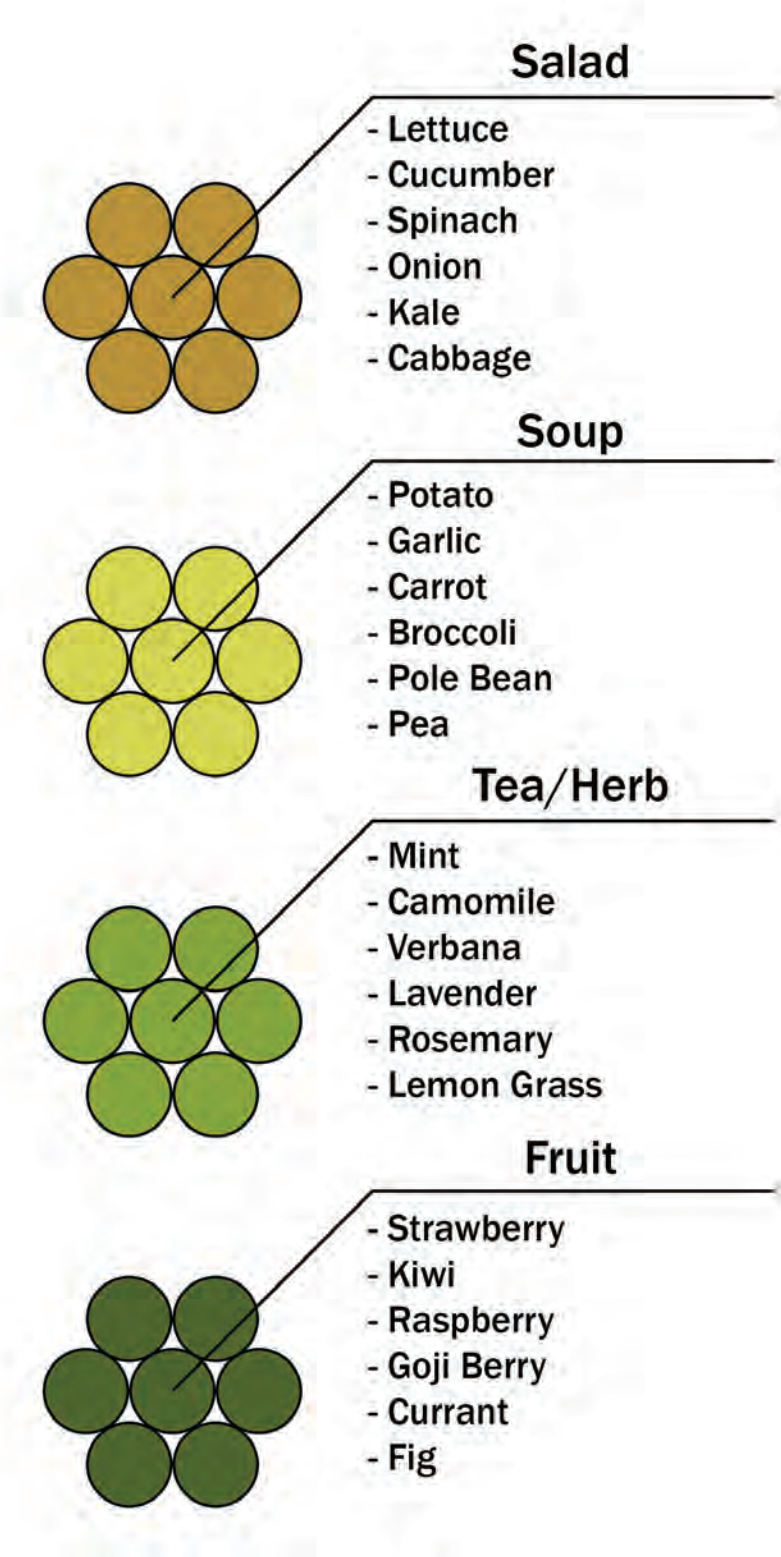
Site Map



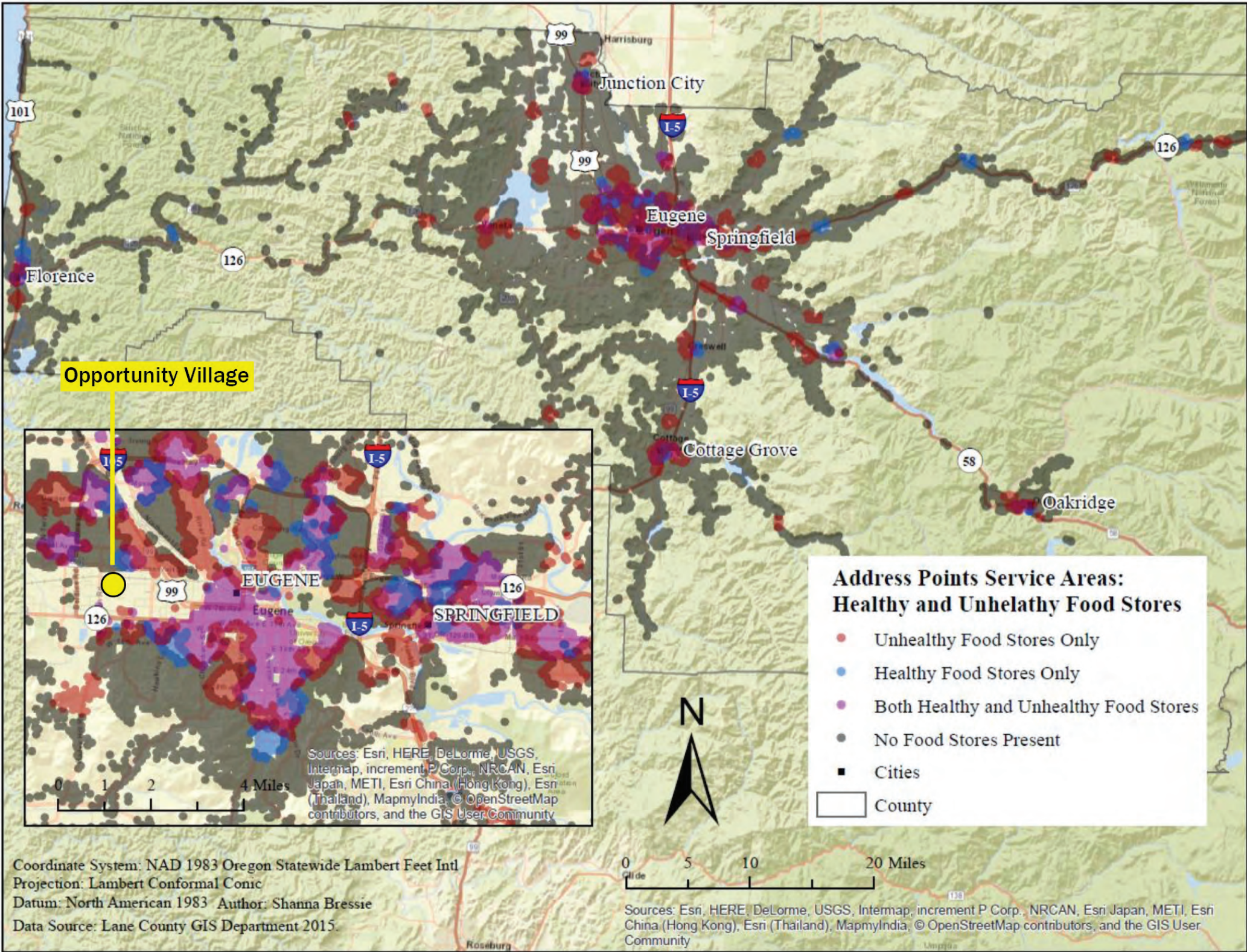
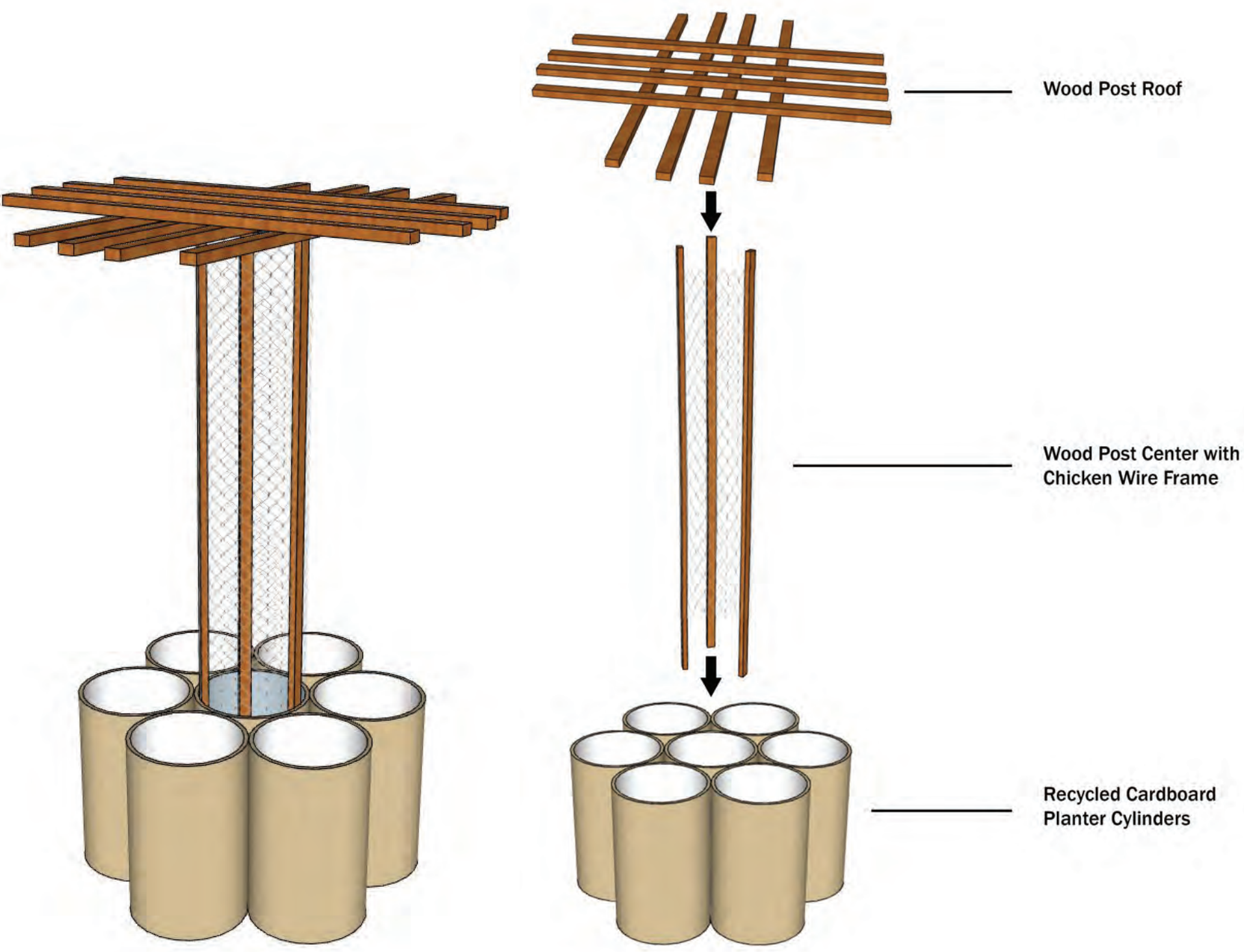
Proposed Design for Opportunity Village Eugene

Based off of a popular design, Public Farm One, located in Queens New York, we chose to take the idea of shaded hexagon shaped planters and apply it to Opportunity Village. After receiving personal insight from the residents of OVE it could be seen that the idea of menu organized gardens would make it easier for residents to know what to farm. We designed a hexagon shaped, multi-crop planter which can be fitted to grow bushy crops like potatoes as well as vine based crops like tomatoes. Our design has seven raised planters organized in a hexagon shape with the central planter containing a trellis which extends upward out from it. This trellis structure will expand outward once it reaches seven feet high giving a feeling of an “artificial tree” or “hanging garden” above their heads. This trellis can provide both shade and a less labor intensive way of picking crops such as tomatoes. There will also be an easy access easy to use irrigation system, on the outside there will be a hose connection to a drip system. This design will be easily moveable as well as built from cheap and reused material. Each unit has an estimated cost of around sixty dollars.

Meal Garden



Planter Design



Food Desert: An area with a lack of easy access to healthy food options

Opportunity Village sits in an area without easy access to food. This project serves to reduce the spread of the food deserts in Eugene, allowing residents of Opportunity Village to have easy and close access to healthy organic food options. This will also develop a new unique food culture in Eugene, allowing for more diverse forms of farming and food access to be available.