Section 3: Design

Master Plan


Legend
1 Field #1
2 Field #2
3 Field #3
4 Field #4
5 Raised Bed Gardens
6 Sensory Garden
7 Distribution Shed
8 Perennial Garden
9 Natural Playground
10 Compost Zone
11 Tool Shed
12 Traditional Orchard
13 High Tunnel
14 Square Foot Gardening Plots
15 Rainwater Barrel
16 Pergola
17 Rain Gardens
18 CoolBot Trailer
19 Pizza/Salsa Garden
20 Solar Field
21 Bathroom
N

Master Plan Details

Fields

1-4. The two main fields have been divided into four smaller fields. The reasoning for this was to allow for proper and easier management of a crop rotation cycle. Currently there is no way of telling what plants were planted in what areas of the garden. By making four fields, it becomes easy to single out a field and not repeat plant in that field. Additionally, when dividing the fields this allows easier walk ability throughout the garden.

Raised Bed Gardens

5. The raised bed gardens would increase in number and a few would be placed along the new packing shed. These raised beds allow for easy accessibility and help to generate high yield, less work produce.

Sensory Garden

6. The sensory garden is located near the entrance to the garden. This garden is supposed to give off a pleasant smell and attract butterflies and birds. While most of the community garden is in food production, it is important to have beautiful perennials and aromas wafting through the air.

Distribution Shed

7. The new distribution shed is located near the southeast corner of the garden. This allows easy access to the road for picking up of deliveries. The location of this new shed was also determined as not to affect any views from the condo residents next door. This location of the shed does not interrupt any views overlooking the garden or farm fields.

Perennial Garden

8. This area is a new and extended perennial garden similar to what already exists. With the construction of the packing shed, landscaping flowers and flowerbeds can be enhanced around the new structure.

Natural Playground

9. This is the area set aside for a natural playground for children. Currently children of LRTR have no place to play while their mothers are volunteering in the garden. Natural playgrounds are quickly getting popular and consist of rocks and logs making them a very sustainable feature of the garden.

Compost Zone

10. The compost zone has been hidden around the back side of the tool shed. This is done to hide much of the compost from condo residents.

Tool Shed

11. This is the existing tool shed that is located at the LRTR garden.

Traditional Orchard

12. Much of the traditional orchard remains intact. A small portion of it will be converted to an experimental high tunnel in the future.

High Tunnel

13. This is the first of three possible high tunnels. By locating it in the upper corner of the garden it remains out of view. Currently the plan calls for one high tunnel because the creation of more would require more of the donated orchard to be changed.

Square Foot Gardening Plots

14. Square foot gardening plots have been laid out in the plan. These are designed spots that are meant to be used for square foot gardening techniques.

Rainwater Barrel

15. Rain barrels are going to be implemented to capture and use rainwater for irrigation. There locations were chosen for ease of access to the sheet steal roofs of the condo buildings. Rain barrels will also be used to capture water off of the new packing shed and pergola roofs.

Pergola

16. This is the current location of the pergola on site. There will be a few changes to the pergola including a solid canvas roof and lattice walls that will block additional sun and wind from the volunteers. This also allows for the pergola to be used as an outdoor classroom.

Rain Garden

17. Two rain gardens will be installed to help with horrible drainage within the garden. One of the areas is located on the side of the pergola and the other is on the southwest corner of the garden.

CoolBot Trailer

18. The CoolBot trailer is a enhanced and retrofit trailer that has refrigeration capabilities. Not only can this trailer keep produce fresh longer but it can be used to make deliveries to people unable to pick up produce themselves.

Pizza/Salsa Garden

19. The pizza and salsa garden is an area where children can be experimental within the garden while growing many foods that children find delicious. Who can turn down a delicious pizza anyway?

Solar Field

20. The solar field is intended to supply power to the garden, while also offering opportunities to earn money through a buyback program with power companies.

Recommendations

Recommendations

Below are recommendations based on project research and community input. Priority levels are suggested with Level 1 being of highest priority.

Priority Level 1

1. Create four fields in the garden to allow for better crop rotation, cover planting and better garden management.
2. Increase compost zone in current location by constructing 4 10'x10' bins with maximum depth of 3' to allow manual turning of the units.
3. Construct a packing shed (10'x22') that will meet the needs for produce handling, washing and storage before distribution.
4. Introduce canvas roof for pergola, lattice walls and an information board to the south and east walls of the pergola. Install a grill that could be used in cooking demonstration and educational events.
5. Install a rainwater collection system and large storage to collect rainwater from identified zones of adjacent condominium roofs for use to irrigate crops.
6. Introduce Square Foot gardening plots for maximized production and use some of plots for season extension with low tunnels.
7. Introduce a nature-based playground north of the pergola that uses natural materials to engage children in play.
8. Plant a "pizza" style garden that is utilized for growing of pizza and salsa ingredients.
9. Create a sensory garden that includes textures and smells by using herbs and perennial flowers.
10. Implement "Back to Eden" technique of using wood chips as cover crop for planting and observe and document the results to inform future action.
11. Implement a crop rotation schedule that helps to remediate soil conditions.
12. Make recruiting and training of garden workers an ongoing priority. Contact youth groups, churches and other after school programs in an effort to get children interested in volunteering at the garden.
13. Establish regular communication, in-person and online, between key garden volunteers and commit time for ongoing garden management.
14. Draw planting plans for each year, communicate them visibly to volunteers in display areas on the pergola structure and proposed packing shed. Observe, document and share the results of each year to inform future action.

Priority Level 2

15. Install a refrigeration trailer used for refrigerating produce and distribution.
16. Introduce rain barrels for rainwater collection from the proposed packing shed and pergola roof.
17. Install drip irrigation to better manage water quantities being used on crops.
18. Enhance existing perennial garden around the entry sign in southeast corner.
19. Increase amount of raised bed gardens to help with maximizing production and increased accessibility for all.
20. Host taste-testing events to get the community members of all ages involved with the garden.
21. Organize garden events around holidays such as Arbor Day and Memorial Day.

Priority Level 3

22. Host an educational series on how to garden at home, promoting healthy eating and food production within the community.
23. Implement a solar field that generates electricity with solar panels that can be used to power the refrigeration trailer and other garden systems.

References

"About Us." Earthworks Urban Farm. N.p., 2008. Web. 17 Dec. 2014.

Bartholomew, Mel. All new square foot gardening. Cool Springs Pr, 2006.

Center for Sustainable Building Research. "Bemidji Community Food Shelf." University of Minnesota-Twin Cities College of Design. Minneapolis, MN. 2013. Print.

Danko, Lauri. "Rain Gardens - Plants - Home Lawn and Garden (Penn State Extension)." Home Lawn and Garden (Penn State Extension). N.p., June 2006. Web. 16 Dec. 2014.

English, Jean. "Extend the Growing Season with Coleman's Double-Covered Low Tunnels." Extend the Growing Season with Coleman's Double-Covered Low Tunnels. Maine Organic Farmers and Gardeners Association, 2014. Web. 16 Dec. 2014.

"Feeding America." Feeding America. N.p., n.d. Web. 14 Dec. 2014.

Ferguson, Bruce K. Introduction to stormwater: concept, purpose, design. John Wiley & Sons, 1998.

Gorgolewski, Mark, June Komisar, Joe Nasr. Carrot City: Creating Places for Urban Agriculture. New York: Monacelli Press, 2011. Print.

Hand, Guy. "Edible Idaho: God in the Garden." Northwest Food News. N.p., 3 May 2010. Web. 25 Nov. 2014.

Hirrel, Suzanne Smith, and Tommy L. Riley. Understanding the Composting Process . Cooperative Extension Service, University of Arkansas, United States Department of Agriculture and county governments cooperating, 1993.

"Inter-cropping." Inter-cropping. OrganicGardenInfo.com, n.d. Web. 16 Dec. 2014.

Ladner, Peter. The Urban Food Revolution: Changing the way we feed cities. Gabriola Island, B.C. : New Society Publishers , 2011. Print.

Lake Region Healthcare. Lake Region Takes Root. Fergus Falls, MN: Lake Region Healthcare, 2014. Print.

"Natural playgrounds more beneficial to children, inspire more play, study finds." ScienceDaily. ScienceDaily, 11 October 2012. <www.sciencedaily.com/releases/2012/10/121011135036.htm>.

Patel, Mukund R. Wind and Solar Power Systems: Design, Analysis, and Operation. Boca Raton, FL: Taylor & Francis, 2006. Print.

Rich, Sarah. Urban Farms. New York: Abrams, 2012. Print.

Richardson, Dana, and Sarah Zents, dirs. "Back to Eden Film." Back to Eden. 21 Aug. 2011. Film.

Strong, Richard. Adjunct Assistant Professor and Senior Research Fellow, Center for Sustainable Building Research. University of Minnesota-Twin Cities. 2014.

"Vertical Gardening." Organic Gardening. Rodale Inc., 2014. Web. 16 Dec. 2014.

Appendix

Conference Call with Deb Mason

Vineyard Boise Garden Coordinator

Deb Mason
Garden Coordinator
Vineyard Boise, Boise Idaho

Others on the call

Virajita Singh
Alexander Thill
Jason Bergstrand
Teresa Brause

Conference Call Notes

Deb said that they discontinued weighing of the food because it took time and labor. She also reiterated that it's not about how much they produce but how many people they can help. This showed us that it's more about the act of growing and helping and not keeping records of yield each year.

They had a few problems this year that affected overall yield of the garden. The first was that there was a drought and ineffective watering took place. Without water the plants don't get as full and lush with produce. The second problem was there was a vine weed infestation. Viney weeds are very difficult to combat when they are choking out produce. Dilemma is do you pull weed and risk pulling produce up as well? Deb told us that overall yield is truly dictated by Mother Nature and the growing season, not just planting techniques and practices.

Things that Vineyard Boise Garden O' Feedin' has learned:

1. Timing (know when produce should be planted and harvested to get maximum yield from all crops)
2. Have consistency in watering (without water the garden does not produce, make a schedule and stick as closely as you can to it)
3. Utilized raised planting boxes (helps to control weeds and allows for greater accessibility when gardening)
4. broadcast planting worked well (not practical at LRTR because volunteers already expressed concerns regarding ground plantings)

Vertical gardening should be utilized if looking to increase production. Also keep in mind the values brought forth by the video Back to Eden.

Design Scenario #1 *Combined Package*

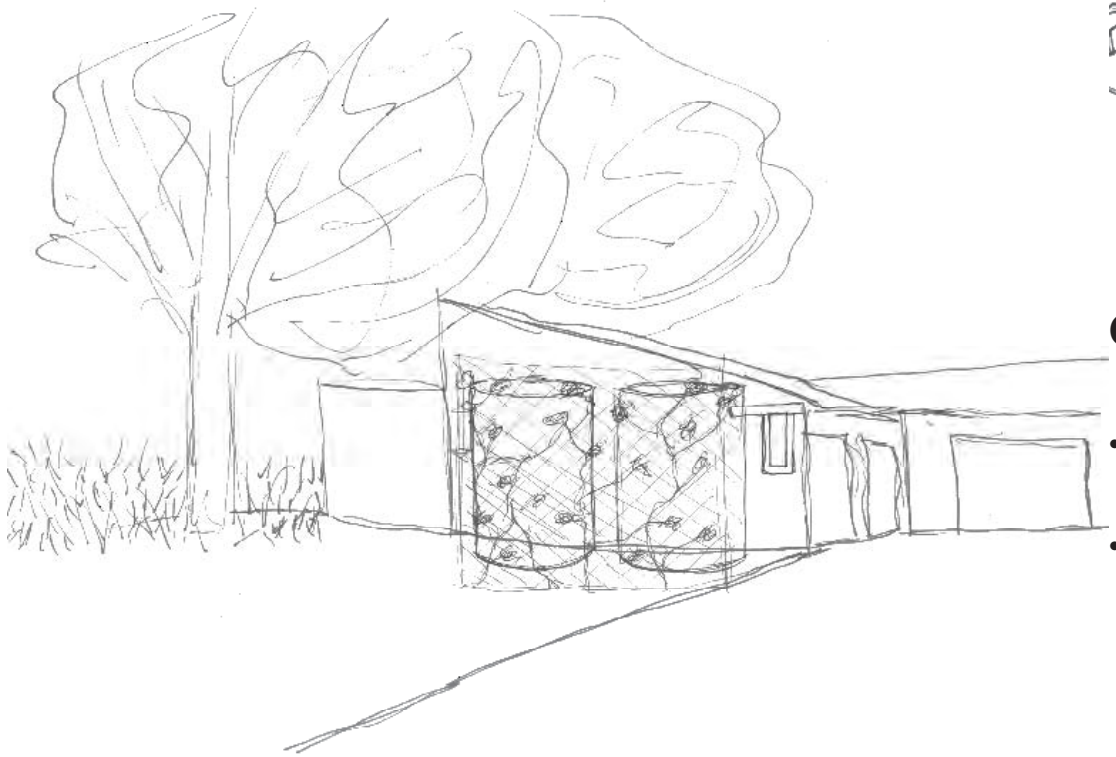
Legend

1. Field #1
2. Field #2
3. Field #3
4. Raised Bed Gardens
5. Sensory Garden
6. Packing/Distribution Shed
7. Perennial Garden
8. Play Area
9. Compost Zone
10. Tool Shed
11. Hoop House Orchard
12. Pergola
13. Rainwater Barrels

Design Aspects

Pros

- 3 Fields allow for easy crop rotation
- Combined wahing and Packing Station
- Hoop houses allow for extended season
- Compost area is designed to be efficient with man power only
- Play area is centralized for easy viewing of children



Cons

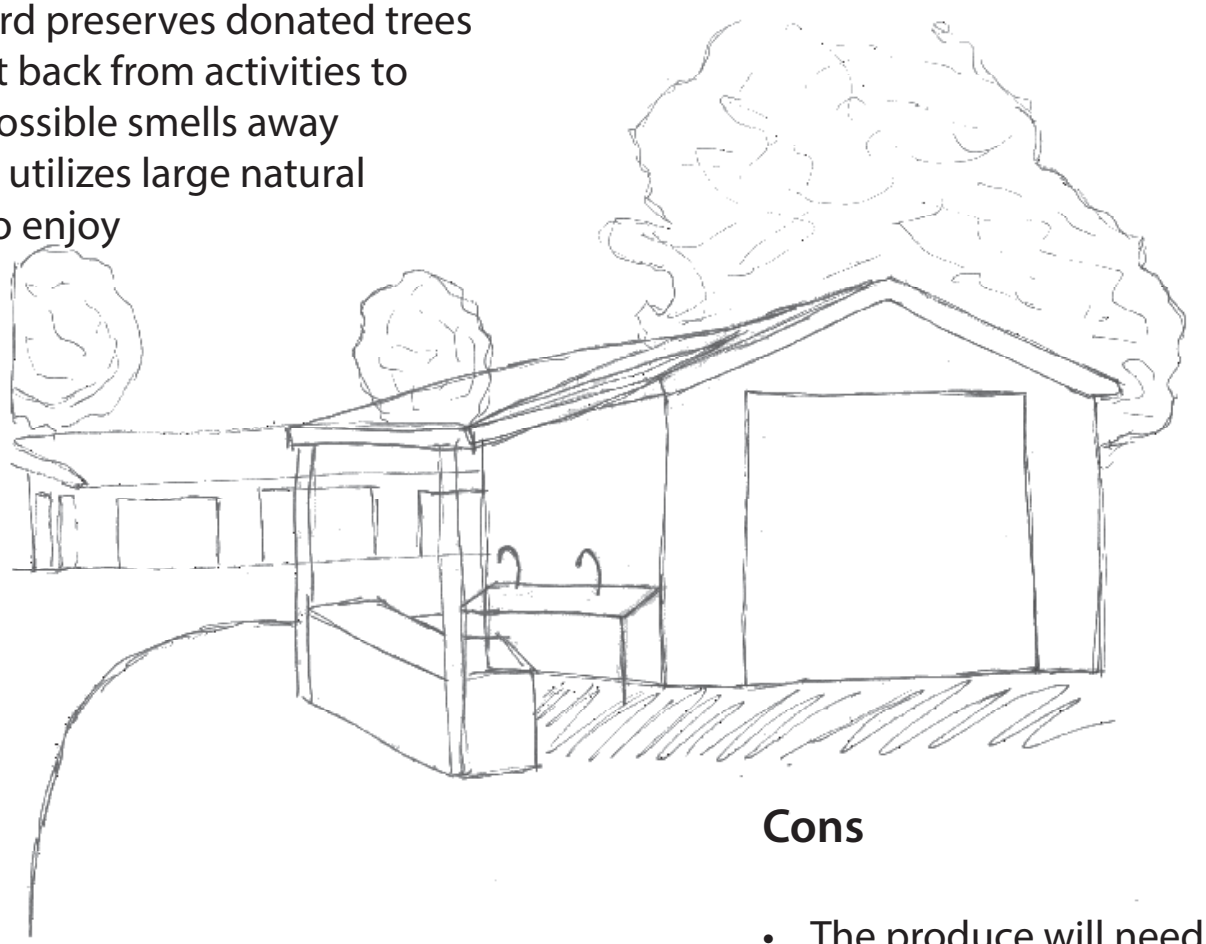
- Most of existing orchard would need to be changed
- Packing shed is larger (10'x20')

Design Scenario #2 Divided Garden

Design Aspects

Pros

- Seperated Washing and Packing shed keeps work and distribution seperate
- Traditional orchard preserves donated trees
- Compost area set back from activities to keep bugs and possible smells away
- Natural play area utilizes large natural objects for kids to enjoy



Cons

- The produce will need to be hauled from back to the front of the garden
- Packing shed may be too small (8'x10')

Lake Region Takes Root

Gardening, Growing, Giving

Lake Region HEALTHCARE
Vision. Integrity. Award winning care.

Afforded an Opportunity

NW & Central Regional Sustainable Development Partnership

Long-term master plan for LRTR

UMN Design Team
Alex Thill
Virajita Singh

Lake Region HEALTHCARE
Vision. Integrity. Award winning care.

Objectives

1. Design Presentation
2. Small Group Discussion
3. Feedback to Design Team
4. Next Steps

Lake Region HEALTHCARE
Vision. Integrity. Award winning care.

Lake Region Takes Root

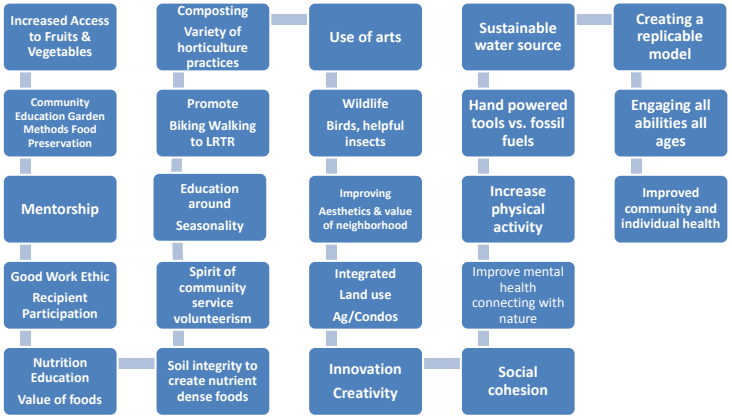
Winter 2013

Lake Region HEALTHCARE
Vision. Integrity. Award winning care.

Vision

Building a **healthier** population by engaging **community** partners to create a **sustainable** local food system that provides education for **all ages** and opportunities to increase access to **local fruits and vegetables**.

Critical values of the community garden



Volunteers making the difference

RDO breaking ground

Harold Stanislawski tilling

Caterpillar

Repurposing the Otter Garden

Early stages

Cover cropping

Young families

The children

Wolden Construction prep education center

Installing the pavers

Noon Rotary Volunteering

Home Depot Donation

November 6th, 2014 Presentation

Wolden Construction prep education center

Installing the pavers

Noon Rotary Volunteering

Home Depot Donation

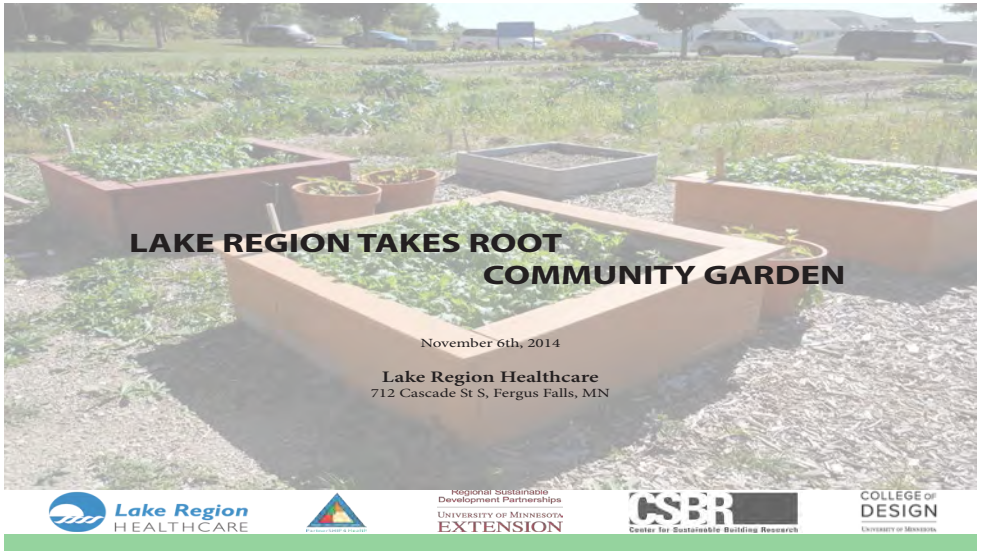
Food donations

1. Women's Infants and Children's (WIC) program
2. Fergus Falls Community Food Shelf
3. Battle Lake Food Shelf
4. Pelican Rapids Food Shelf
5. Matthew House

Impact

	# Produce Donated	# People Served
2013	1,600	313 families
2014	4,500	3313 Individuals
2019	25,000 ?	5,000 Individuals ?

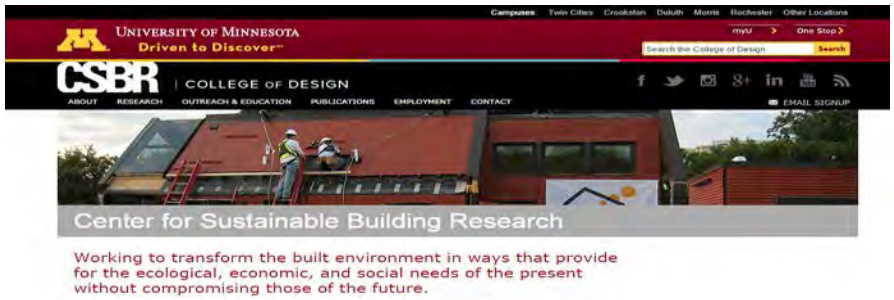
Long Range Plan Will Help Guide Our Future Efforts



Who we are

Virajita Singh *Senior Research Fellow at the Center for Sustainable Building Research*

Alexander Thill *MLA candidate 2016 at University of Minnesota Twin Cities*



Who we are

Goals

Community Goals brought forth by LRTR

- Maximize production; up to **25,000+ pounds** of food a year
- **Compost onsite;** becoming environmental stewards reducing landfill waste
- **Collect stormwater** from surrounding businesses and use on site
- Create an **educational experience** to teach others how to garden
- Create a **community service** that reflects highly within the community
- Generate **social cohesion** within the community

LRTR Program needs

- **Packing Shed** for distribution
- **Increased accessibility** of the garden
- **Wind** and **sun break** for volunteers
- **Hoop house** orchard
- **Crop rotation schedule**
- **Rainwater harvesting system**

Additional needs

- Refrigeration option/cold celler
- Drip irrigation to maximize effecency with watering techniques
- Lack of bathroom

Sustainability Frameworks

LIVING BUILDING CHALLENGE

MINNESOTA 3 GUIDELINES

- Place
- Water
- Energy
- Materials
- Health and Happiness

Precedents: The Garden O' Feedin'

- Started in 1998, the garden now provides hundreds of families with fresh produce and vegetbles.
- Located in Boise, Idaho
- Part of the Vineyard Ministery created to help the needy in their community.
- In 2009 the garden produced 31,000 pounds of food on only two thirds of an acre.

"It all sort of came together. Our organic garden was an expression of our attitude towards creation in many ways. We realized we could actually connect these two worlds, especially when it came to our responsibility to the poor." - Pastor Tri Robins

Precedents: Earthworks Urban Farm

"Earthworks has always been a labor of love, founded on the Franciscan vision of universal sister and brotherhood of all creation." (Earthworks, 2014)

- Started in 1997 under the mission to feed the hungry and care for the poor
- Located in Detroit Michigan
- Has become a poster child of sorts in the expanding effort to get involved in community gardening.
- Since 2008, Earthworks has switched its practices from distribution of whole foods to distribution of cooked foods through *The Capuchin Soup Kitchen*.

"Urban Farming is uniquely powerful tool for change, in that it can simultaneously reshape the places where we live and the way we eat." (Rich, 2012)

Urban Agriculture Techniques

Square Foot Gardening

- Small mangeable beds are planted densely together
- Able to grow lots of food with limited space
- Limits weeds and excessive fertilization

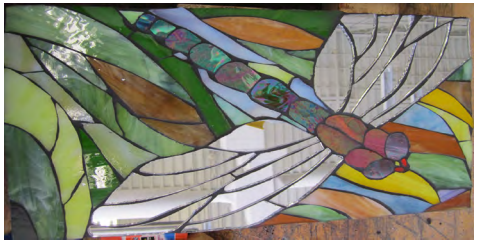
Sizing

- Typical box size is 4 ft by 4ft
- It produces enough food for 1meal, for 1 person for 1 day
- Keep 3 feet between the boxes to create accessibility and room to garden

Cold frames

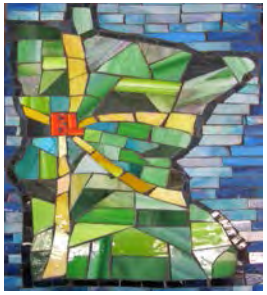
- Can be added to raised box planters to lengthen the growing season.
- Consit of an empty bottom box that is covered with either a glass or some kind of transparent material
- The covering acts as a greenhouse does and protects plants from hard frost an maintains a constant temperature

Connection to the Arts



Complete Streets, Battle Lake, MN

- Wanted to increase art appreciation in the community
- Project took place along Lake Avenue.
- Decided that glass mosiacs would be installed into tree benches
- Benches reflect different themes, natural habitat, agriculture and recreation



There are many opportunities to showcase art within the LRTR community garden. Some of the ways discussed could be sculpture pieces, mural walls and artistic planter boxes.

Precedents: Composting

- Landfills are quickly coming to capacity, space is becoming valuable.
- Composted material can be used to treat nutrient deficent soils helping to grow stronger crops.
- Full of nitrogen and carbon.
- When added to soil, helps to promote extensive root growth and development.
- Compost also helps to retain water in the soil longer, requiring less irrigation.

Precedents: Rainwater Harvesting

17th Ave Resident Hall, U of M

- Total volume is **38,000 gallons** rainwater.
- System is used as a sustainable way to flush toilets in the new residence hall.
- Used as an **educational tool** for students, faculty and other development projects.
- Currently being looked at for a project in St. Paul involving a baseball stadium.

Chicago Center for Green Technology

- Double LEED Platnium status for both building footprint and operational status.
- Collects **1000's of gallons** of water in above ground water tanks.
- Many are **hidden by vegetation** as you can see in the pictures.
- Used in the irrigation of green wall vegetation and the landscape.

Opportunities for Rainwater Collection

Rainwater Calculations

Area 1 Calculations

Equations:
WQV=(P)(Rv)

WQV=Water Quantity Value
P=Rainwater event in inches
Rv=Runoff coefficient

Rv=0.05+0.009(I)

I=Percent of the surface that is impervious

Calculations:

Rv=0.05+0.009(100)
Rv=**0.95**

WQV=(1.25")(0.95)
=**1.1875 inches**

Then convert to cubic feet

1.1875in/12in= **.0989 ft**

Multiply by the square footage of the surface

(.0989ft)(875sqft)=**86.5** cubic feet of water

Convert cubic feet to gallons *(7.48 gallons per cubic foot)*

(86.5 cubic ft)(7.48 gallons)
=**647.02** gallons of water in a 1.25" rainfall event

Area 2 Calculations

Equations:
WQV=(P)(Rv)

WQV=Water Quantity Value
P=Rainwater event in inches
Rv=Runoff coefficient

Rv=0.05+0.009(I)

I=Percent of the surface that is impervious

Calculations:

Rv=0.05+0.009(100)
Rv=**0.95**

WQV=(1.25")(0.95)
=**1.1875 inches**

Then convert to cubic feet

1.1875in/12in= **.0989 ft**

Multiply by the square footage of the surface

(.0989ft)(2,315sqft)=**228.95** cubic feet of water

Convert cubic feet to gallons *(7.48 gallons per cubic foot)*

(228.95 cubic ft)(7.48 gallons)
=**1,712.57** gallons of water in a 1.25" rainfall event

Design Scenario #1 *Combined Package*

Design Aspects

Pros

- 3 Fields allow for easy crop rotation
- Combined wahing and Packing Station
- Hoop houses allow for extended season
- Compost area is designed to be efficient with man power only
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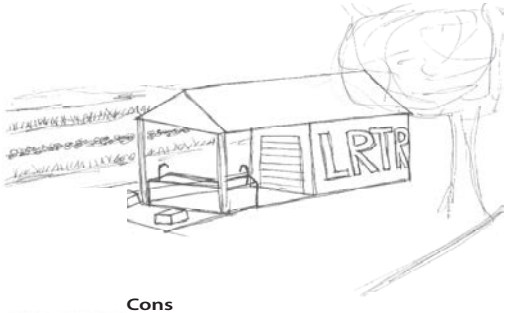

Cons

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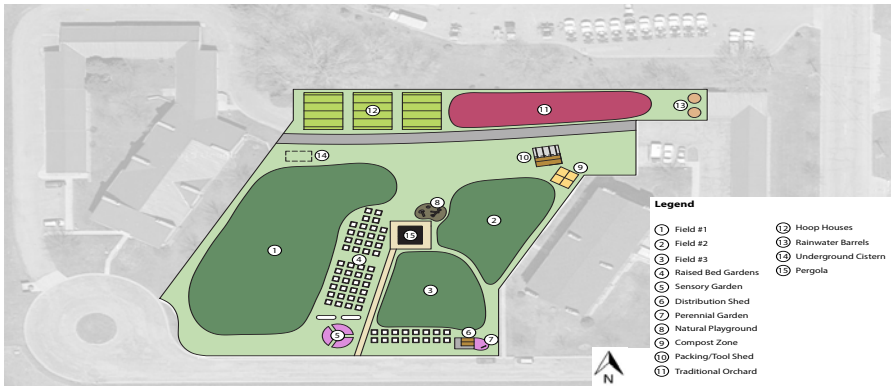
Design Scenario #2 *Divided Garden*



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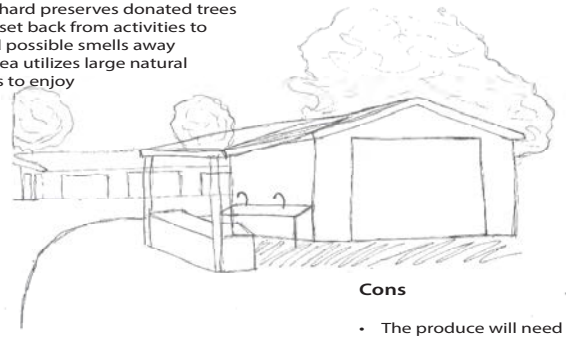

Cons

- The produce will need to be hauled from back to the front of the garden
- Packing shed may be too small (8'x10')

Your Input

5:30 – 6:00 Small Group Discussion

6:00 – 6:30 Feedback to Design Team

6:30 – 6:45 Wrap Up and Next Steps

Your Input

Group 1	Volunteer Recruitment *How might we move this forward?*
Group 2	Food Distribution *Who is involved and how?*
Group 3	Client engagement *Help with growing food and education?*
Group 4	Horticulture Issues suggestions like organic pest control, crop rotation, companion planting, higher yields?
Group 5	Fundraising Ideas for fundraising?

Your Input

Step 1:

Each group take 5-10 minutes to review design scenarios and add your input individually on post-it notes and add to flip chart paper

Your Input

Step 2:

Each group think about your topic of focus and propose ideas individually and collectively on post-it notes and add to second sheet of flip chart paper

Your Input

Group 1	Volunteer Recruitment *How might we move this forward?*
Group 2	Food Distribution *Who is involved and how?*
Group 3	Client engagement *Help with growing food and education?*
Group 4	Horticulture Issues suggestions like organic pest control, crop rotation, companion planting, higher yields?
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November 6th, 2014 Presentation