Section 3: Design
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


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


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

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
Pros

- 3 Fields allow for easy crop rotation
- Combined washing 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**

Legend:

1. Field #1
2. Field #2
3. Field #3
4. Raised Bed Gardens
5. Sensory Garden
6. Distribution Shed
7. Perennial Garden
8. Natural Playground
9. Compost Zone
10. Packing/Tool Shed
11. Traditional Orchard
12. Hoop Houses
13. Rainwater Barrels
14. Underground Cistern
15. Pergola

Lake Region Takes Root Community Garden: Maximizing Sustainable Food Production 48
Pros

• Seperated Washing and Packing shed keeps work and distribution separate
• 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’)

Design Aspects
Lake Region Takes Root
Gardening, Growing, Giving

Afforded an Opportunity
NW & Central Regional Sustainable Development Partnership
Long-term master plan for LRTR

UMN Design Team
Alex Thill
Virajita Singh

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

Lake Region Takes Root

Dreams
Winter 2013
**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.

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**Critical values of the community garden**

- Increased Access to Fruits & Vegetables
- Composting
- Use of arts
- Sustainable water source
- Creating a replicable model

- Community Education Garden
- Methods Food Preservation
- Wildlife
- Birds, Helpful Insects
- Hand powered tools vs. fossil fuels
- Engaging all abilities all ages

- Mentorship
- Education around Seasonality
- Improving Aesthetics & value of neighborhood
- Increase physical activity
- Improved community and individual health

- Good Work Ethic Recipient
- Participation
- Spirit of community service, Volunteering
- Integrated Land use Ag/Condos
- Improve mental health, connecting with nature

- Nutrition Education
- Value of foods
- Soil integrity to create nutrient dense foods
- Innovation Creativity
- Social cohesion

- Hand powered tools vs. fossil fuels
- Engaging all abilities all ages
- Improved community and individual health
Lake Region Takes Root Community Garden: Maximizing Sustainable Food Production

November 6th, 2014 Presentation

Volunteers making the difference

RDO breaking ground

Harold Stanislawski tilling

Caterpillar

Repurposing the Otter Garden

Early stages

Wolden Construction prep education center

Installing the pavers

Cover cropping

Noon Rotary Volunteering

Young families

Home Depot Donation

The children
**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**

<table>
<thead>
<tr>
<th>Year</th>
<th># Produce Donated</th>
<th># People Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1,600</td>
<td>313 families</td>
</tr>
<tr>
<td>2014</td>
<td>4,500</td>
<td>3313 Individuals</td>
</tr>
<tr>
<td>2019</td>
<td>25,000 ?</td>
<td>5,000 Individuals ?</td>
</tr>
</tbody>
</table>

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**

- **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 cellar
  - Drip irrigation to maximize efficiency with watering techniques
  - Lack of bathroom

**Sustainability Frameworks**

- **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 vegetables.
- Located in Boise, Idaho
- Part of the Vineyard Ministry 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)

Precedents: Composting

- Landfills are quickly coming to capacity, space is becoming valuable.
- Composted material can be used to treat nutrient deficient 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.

Urban Agriculture Techniques

Square Foot Gardening

- Small manageable 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 1 meal, 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.
- Consist 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 and 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 mosaics 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: Rainwater Harvesting

17th Ave Resident Hall, U of M
- Total volume is 38,000 gallons of water.
- System is used as a sustainable way to flush toilets and also for a project in St. Paul involving a baseball stadium.
- Currently being looked at for a project in St. Paul.

Chicago Center for Green Technology
- Double LEED Platinum status for both building footprint and operational status.
- Collects thousands 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)

Calculations:
I=Percent of the surface that is impervious

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=0.0989 ft

Multiply by the square footage of the surface
(0.0989ft)(875sqft)=86.6 cubic feet of water

Convert cubic feet to gallons (7.48 gallons per cubic foot)
86.6 cubic ft(7.48 gallons)=647.02 gallons of water

**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)

Calculations:
I=Percent of the surface that is impervious

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=0.0989 ft

Multiply by the square footage of the surface
(0.0989ft)(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

Design Scenario #1 Combined Package
Design Aspects

Pros
• 3 Fields allow for easy crop rotation
• Combined washing 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
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Design Aspects

Pros
• Separated Washing and Packing shed keeps work and distribution separate
• Traditional orchard preserves donated trees
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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’)

Design Scenario #2 Divided Garden

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?

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

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
Thank You for your participation!