

# Greenprint Detroit

A Masters Project submitted  
in partial fulfillment of the requirements  
for the degree of  
Master of Science / Master of Landscape Architecture  
(Environment and Sustainability)  
in the University of Michigan  
April 2022

**PREPARED BY**

Jingzhi Fan, Sharni Smith, Yiyuan Wang, Yizhu Lu  
Advisor: Lisa DuRussel RLA, LEED AP  
Client: Simon David (OSD)

## ACKNOWLEDGMENTS

Thank you to Lisa DuRussel, our faculty advisor, for lending continuous encouragement, patience, and endless wisdom.

We would also like to express our gratitude for the countless others who have made this project possible, including:

Simon David, OSD (Client)  
 Dolores Perales  
 The Detroit Land Bank Authority  
 Eastside Community Network  
 Detroit Future City  
 MACC Development  
 Canfield Consortium  
 CDAD

We are particularly grateful to the many members of the Goodstock community and greater Detroit area whose insight and ideas have formed the foundation of this project.

## ABSTRACT

Navigating the various government programs for vacant land purchase in Detroit can be overwhelming, often resulting in confusion and frustration.

Within this context, Greenprint Detroit aims to provide a toolkit for residents on how to attain and transform vacant land through processes already in place by the Detroit Land Bank. By laying out these programs and other helpful land-use resources, the goal is to help place land back in the hands of Detroit residents. The project aims to begin the process of developing a citywide Greenprint; one that represents a vision for a creative, holistic, system-wide network of reclaiming vacant, interstitial open space.

This plan will also provide guidance in ways of which to address the increasing challenges of climate change and the negative environmental effects that come with it within the context of Detroit communities.

**01** **PURPOSE** **PAGE 6**

In order to understand the project, one must first understand the context in which this project was created. Vacant land availability in conjunction with new government funding has created important opportunities for Detroit residents in terms of land ownership.

**02** **TOOLKIT** **PAGE 24**

The toolkit takes preexisting programs run by the DLBA and provides a decision making tool to help residents determine the best fit for their own needs. The programs are then broken down into possibilities and real life opportunities within the Goodstock community.

**03** **VISION** **PAGE 46**

Detroit, like many cities across the world, is facing the direct results of a changing climate. This section hopes to outline some of the ways in which residents can help mitigate these effects and prepare the city as it becomes a 'climate haven'.

DETROIT CONTEXT.....8  
 DETROIT LAND BANK AUTHORITY.....9  
 GOODSTOCK.....10-17  
 ENGAGEMENT.....18-23

DECISION MAKING TOOL.....26-31  
 SIDE LOTS.....32-33  
 ACCESSORY STRUCTURE LOTS.....34-37  
 OVERSIZE LOTS.....38-39  
 NEIGHBORHOOD LOTS.....40-41  
 INFILL HOUSING LOTS.....42-43  
 HOMESTEAD LOTS.....44-47

CLIMATE IMPACTS.....48-51  
 CLIMATE ADAPTATION.....52-63  
 CASE STUDIES.....64-69  
 RESOURCES.....70-75  
 APPENDIX.....76-121

# PURPOSE

---



# Detroit Context

## DETROIT

Detroit is among the most vibrant, densely populated areas of Southeast Michigan, but is faced with disproportionate environmental and health burdens in addition to aging stormwater infrastructure. These challenges are expected to become more pressing in the future with an expected climate migration to the Great Lakes and increased precipitation putting further demands on infrastructure and services.

Legacy cities like Detroit “present a distinct context for climate planning. Legacy cities are those

that have experienced a significant loss of industry and manufacturing employment since the mid-twentieth century, which contributed to depopulation through the mass suburbanization of residents”. (Mallach and Brachman 2013)

Meanwhile, urban agriculture, sustainability, and green design opportunities are expanding in the City of Detroit due to an excess of vacant land. For Detroit communities looking to make an impact, the first step is often gaining ownership of this land.



SOURCE: [www.nbcnews.com/news](http://www.nbcnews.com/news)



SOURCE: [detroitnews.com](http://detroitnews.com)

## DETROIT LAND BANK AUTHORITY

The Detroit Land Bank Authority (DLBA) is a public authority that owns and manages approximately 100,000 parcels of property in the City of Detroit, making it the city’s largest landowner. With the mission of returning the city’s blighted and vacant properties to productive use, the DLBA utilizes a variety of sales programs to make homeownership and land purchases accessible to Detroiters.

The sales programs that are currently available and highlighted in the Greenprint toolkit include side lots, accessory structure lots,

oversized lots, neighborhood lots, infill lots, and homestead lots. Each of these lot types come with their own rules, guidelines, and opportunities which we hope to highlight in the following pages.

The Detroit Land Bank Authority works directly with individual buyers, as well as Community Partner organizations and developers for projects big and small.



SOURCE: [detroitfuturecity.com](http://detroitfuturecity.com)



SOURCE: [planetdetroit.org](http://planetdetroit.org)

# Goodstock

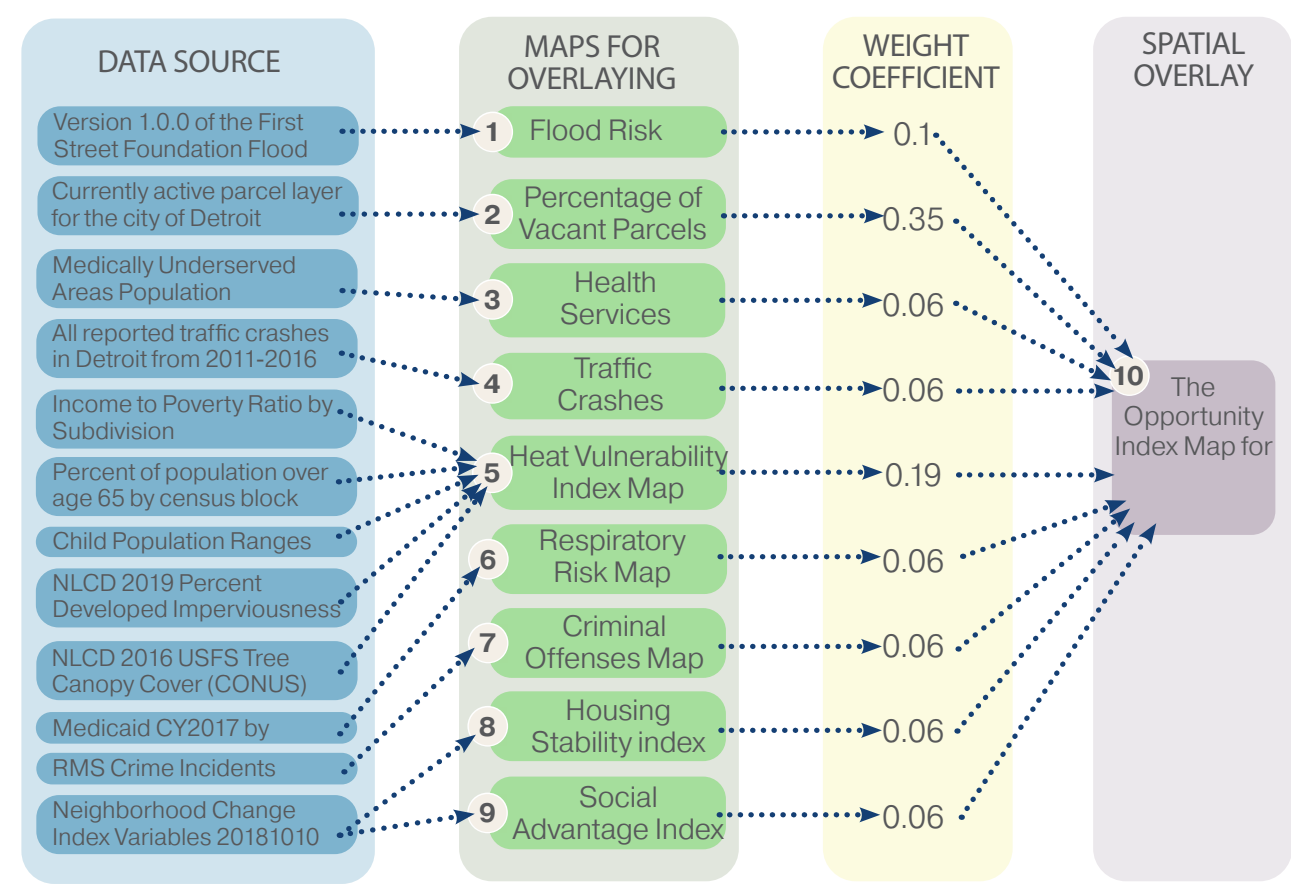
In order to choose a Detroit community to use as an example site for the project, the team began by determining what kinds of factors were important in a case study site. The data we looked at included:

- Proportion of vacant land
- Heat vulnerability
- Flood risk
- Health factors
- Traffic data
- Crime data
- Housing stability index
- Social advantage index

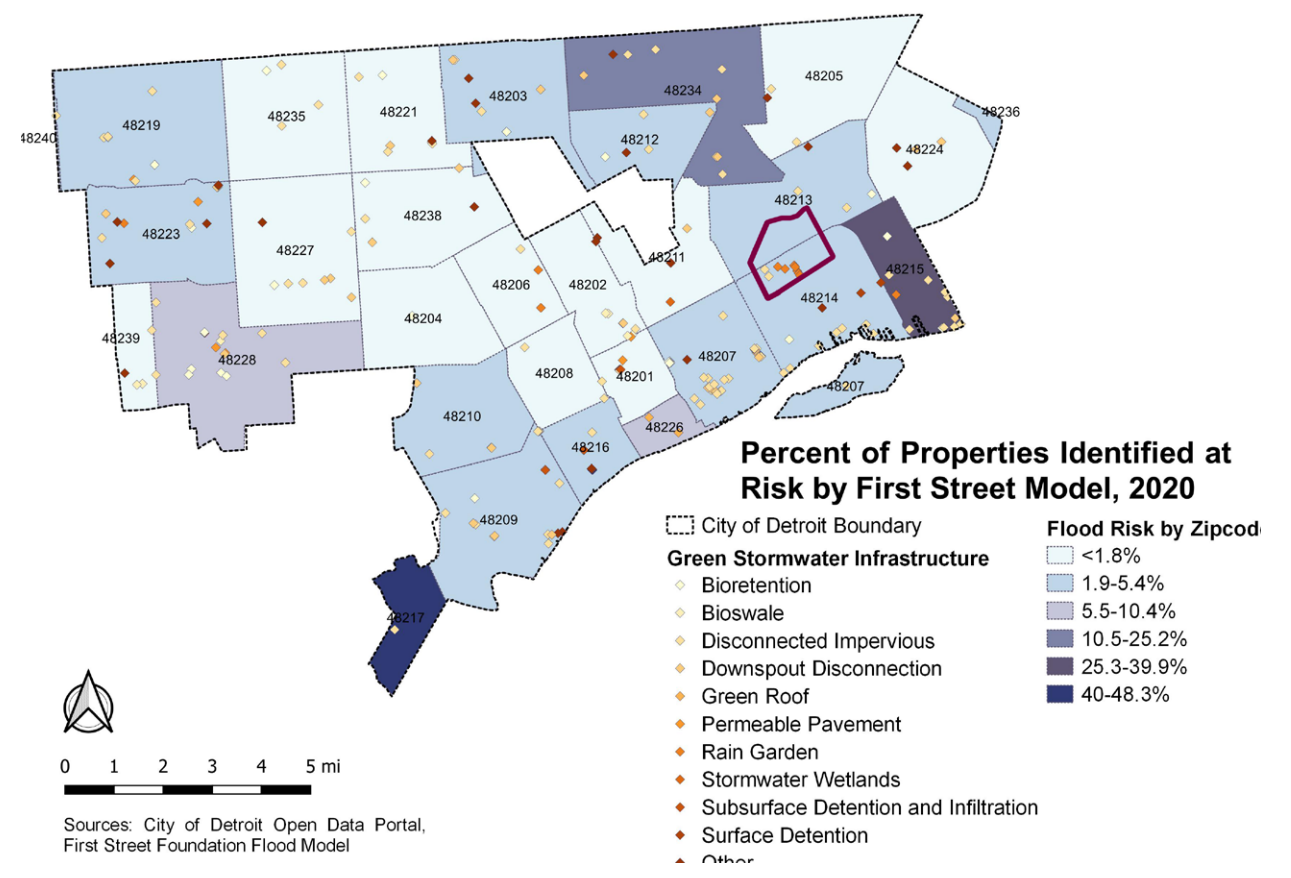
We also cross referenced our findings with other Detroit community analyses like the Detroit Future City Strategic Framework and Turning the Corner made by Data Driven Detroit.

After layering this data, we identified a number of key locations within the City of Detroit for potential landscape interventions. The community of Goodstock was chosen because of the communities high possibility for adaptive possibilities.

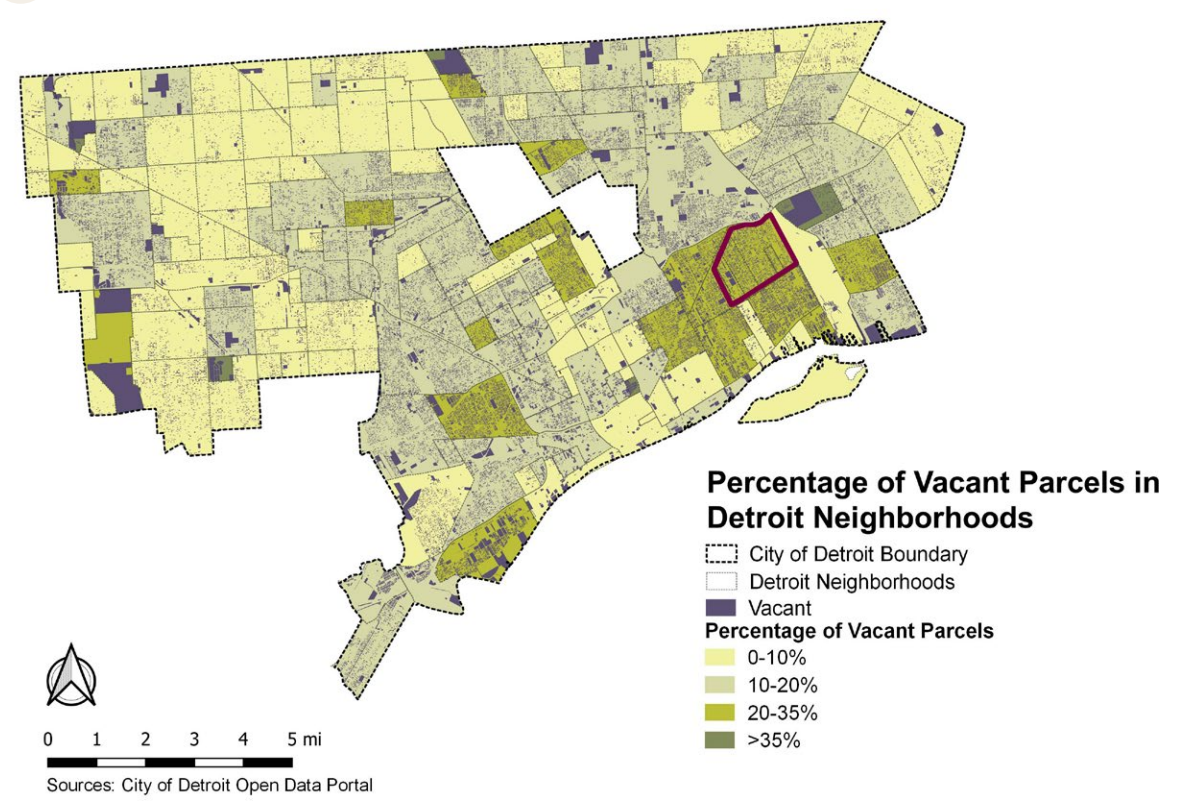
## WORKFLOW



## 1 Flood Risk Map

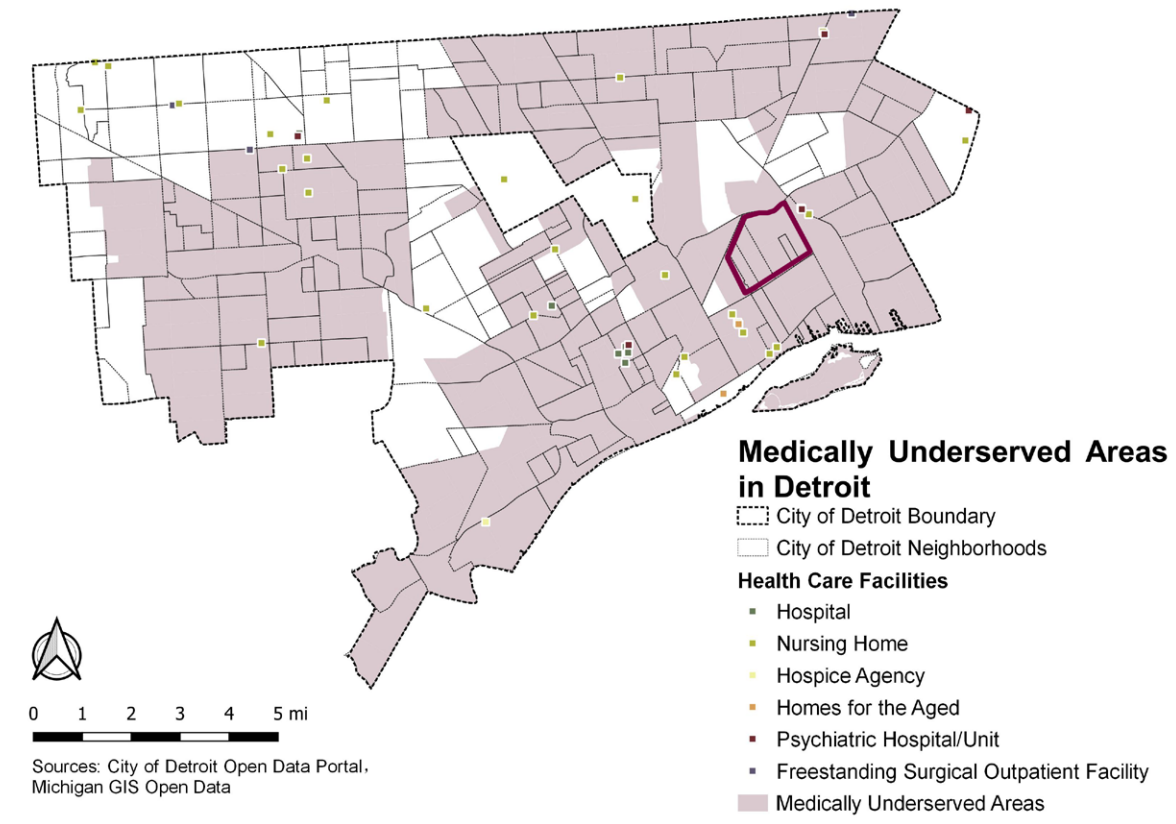


## 2 Percentage of Vacant Parcels

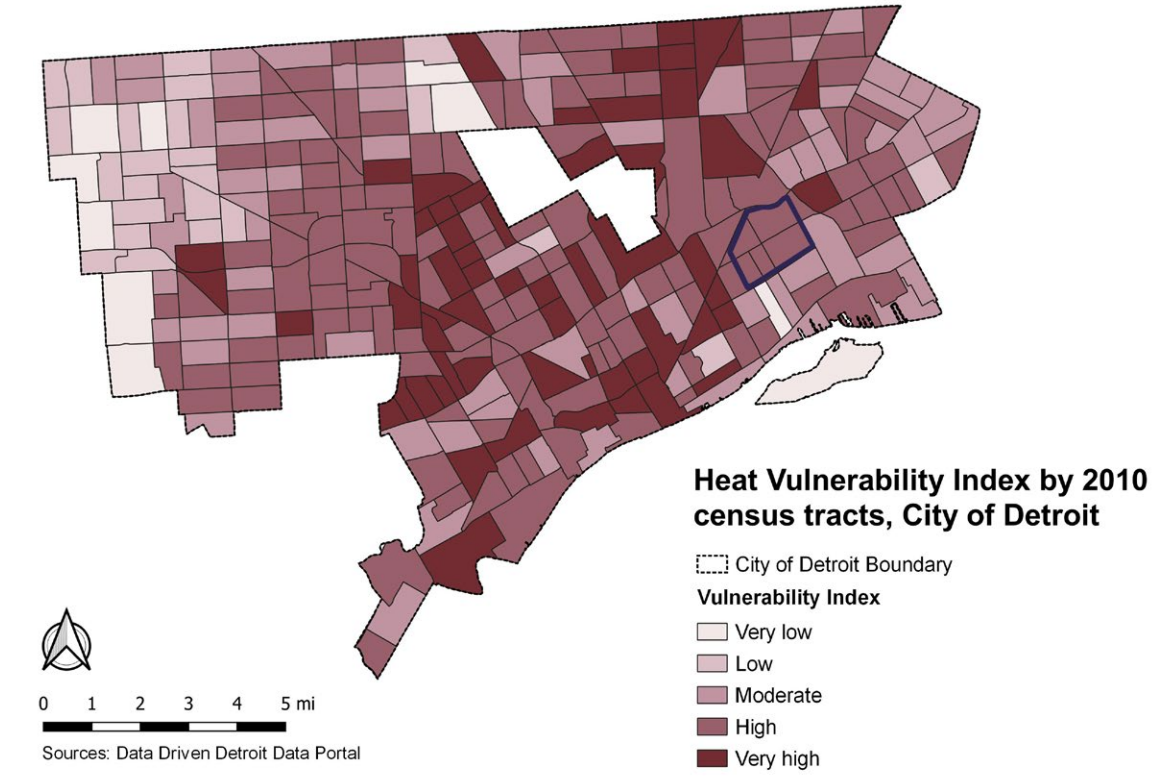




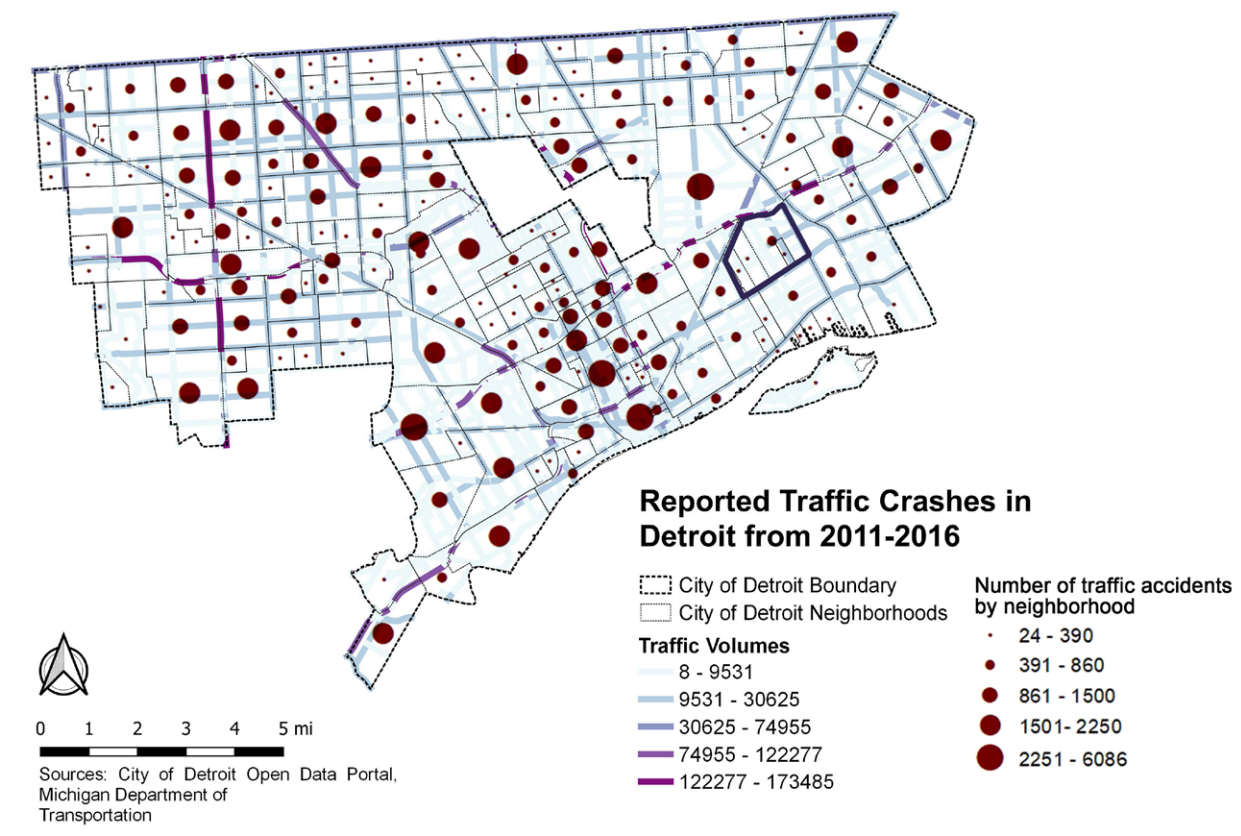
### 3 Health Services Map



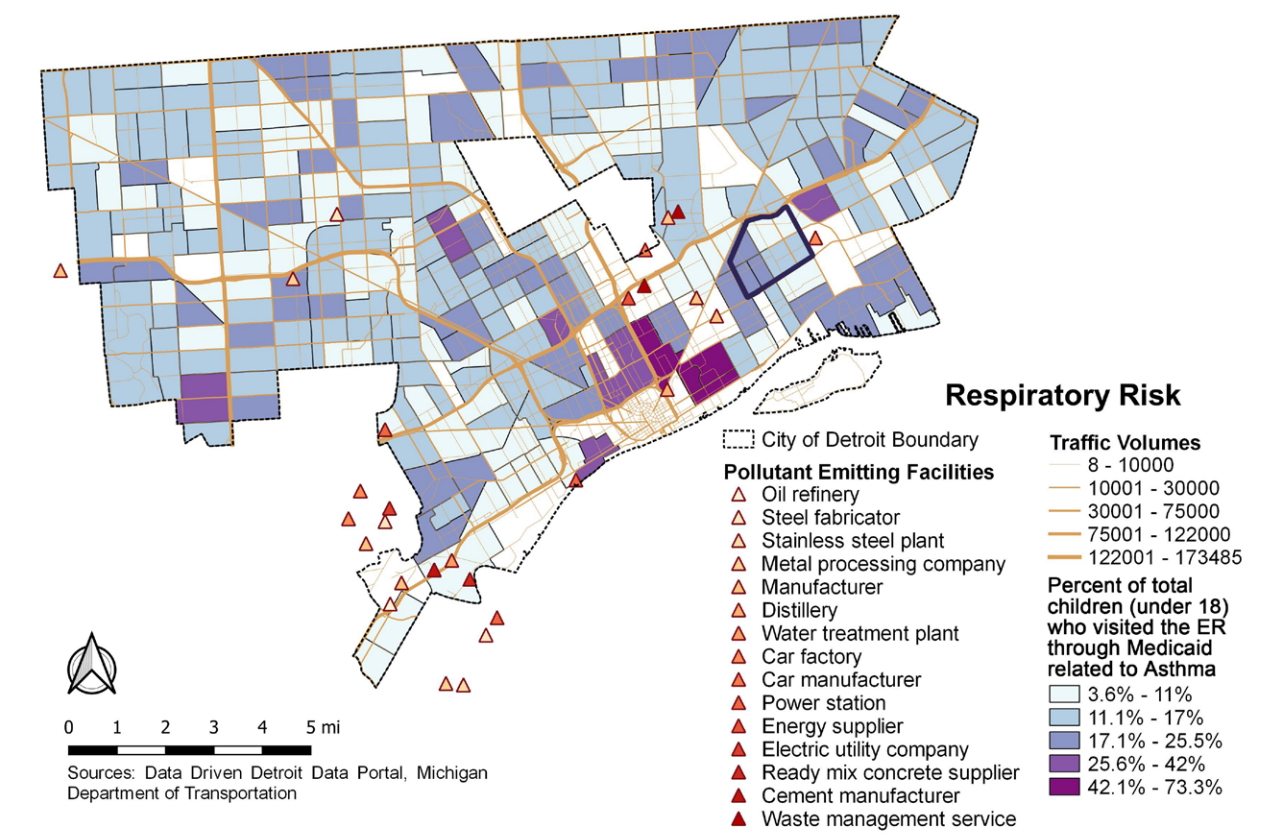
### 5 Heat Vulnerability Index Map



### 4 Traffic Crashes Map

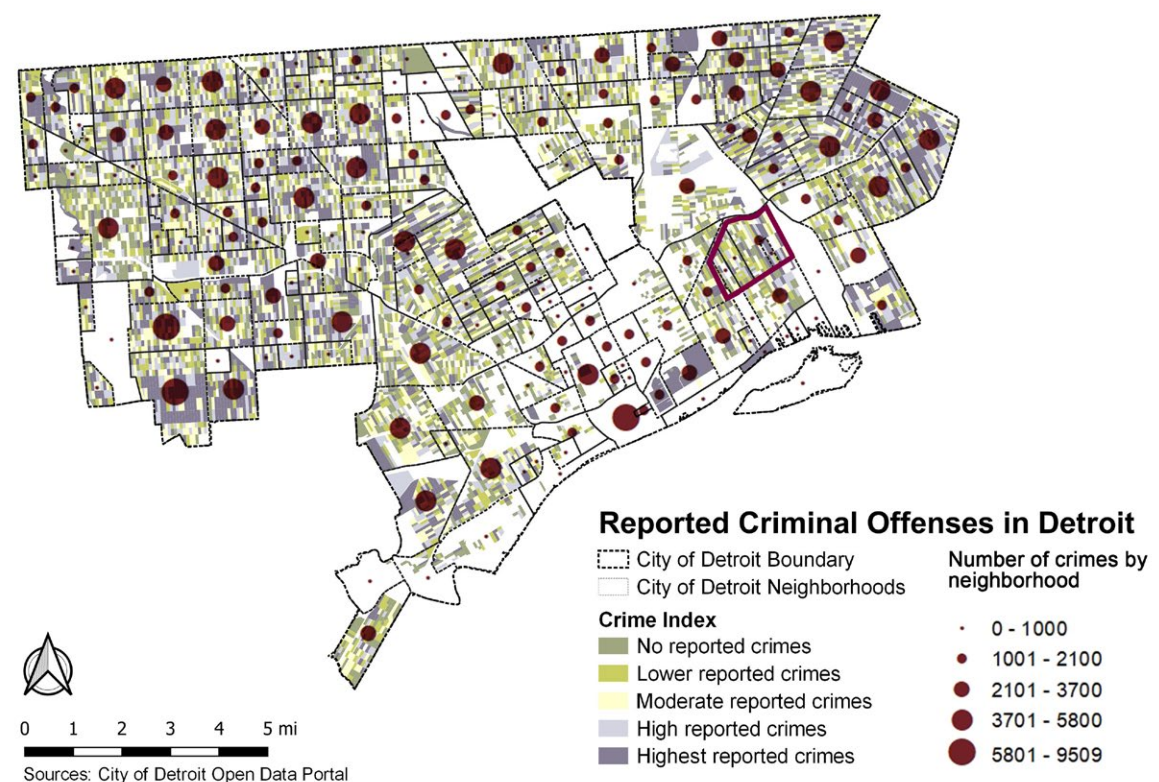


### 6 Respiratory Risk Map

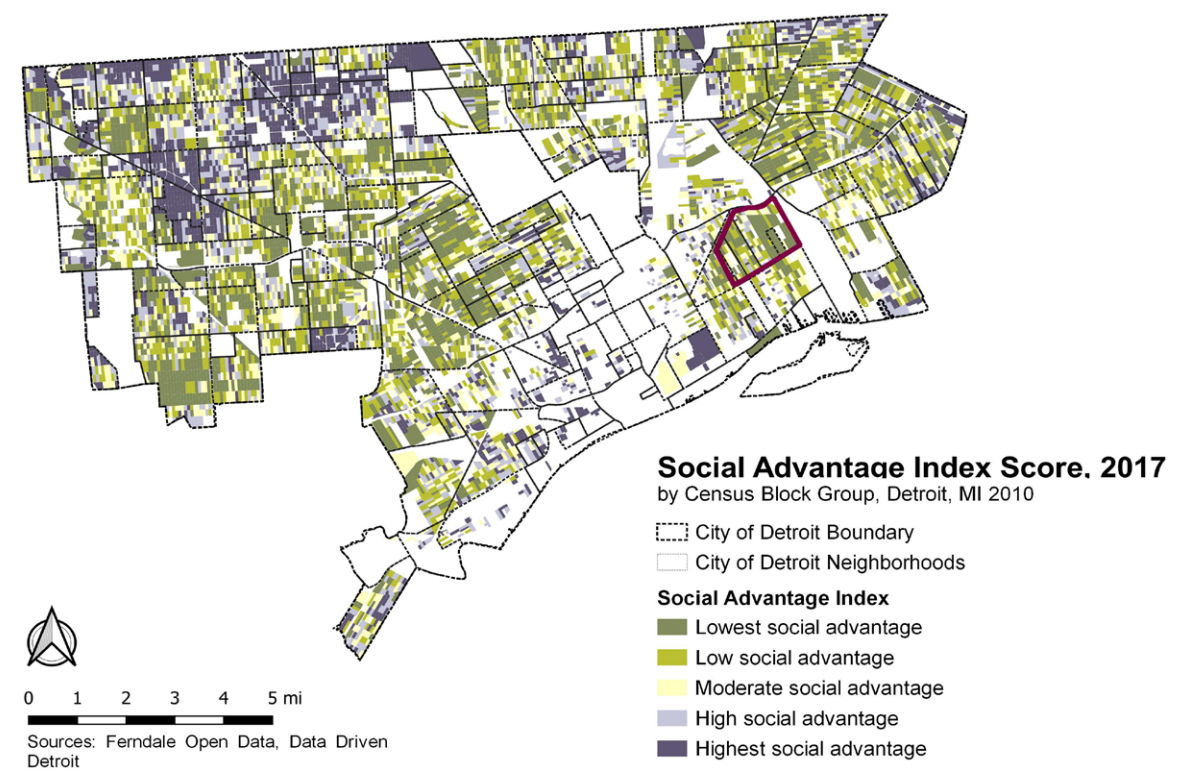




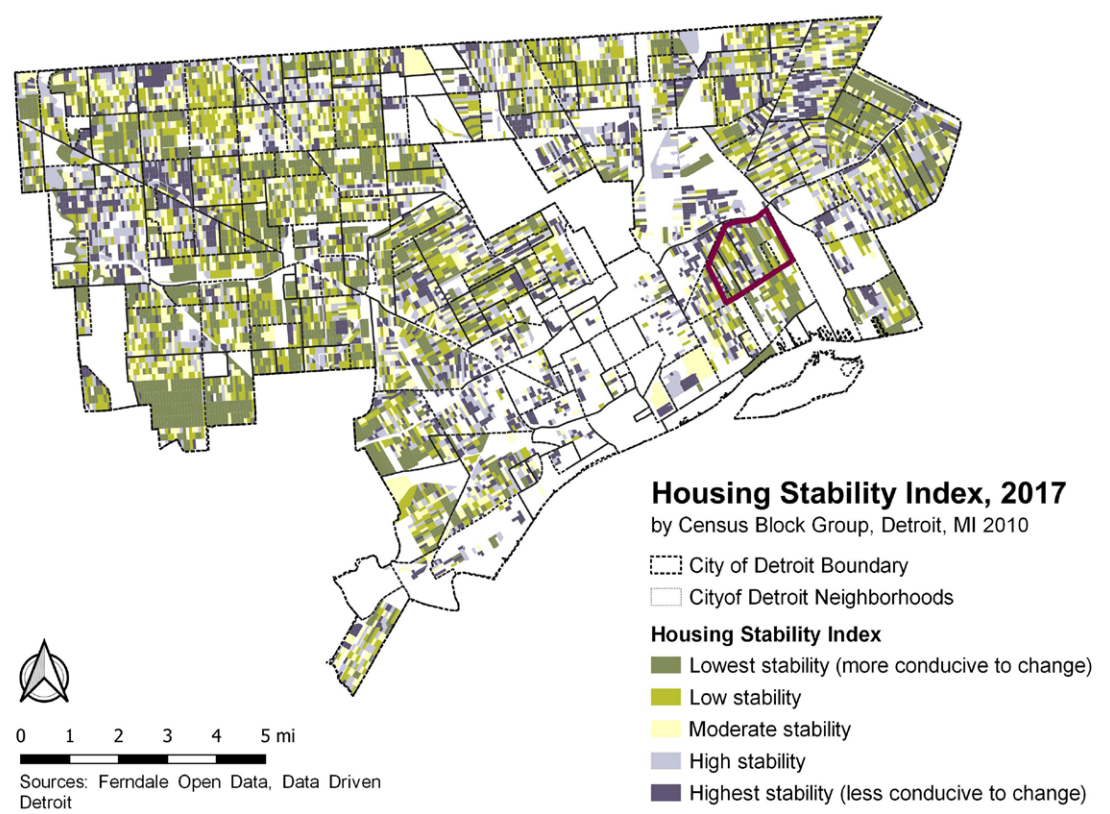
7 Criminal Offenses Map



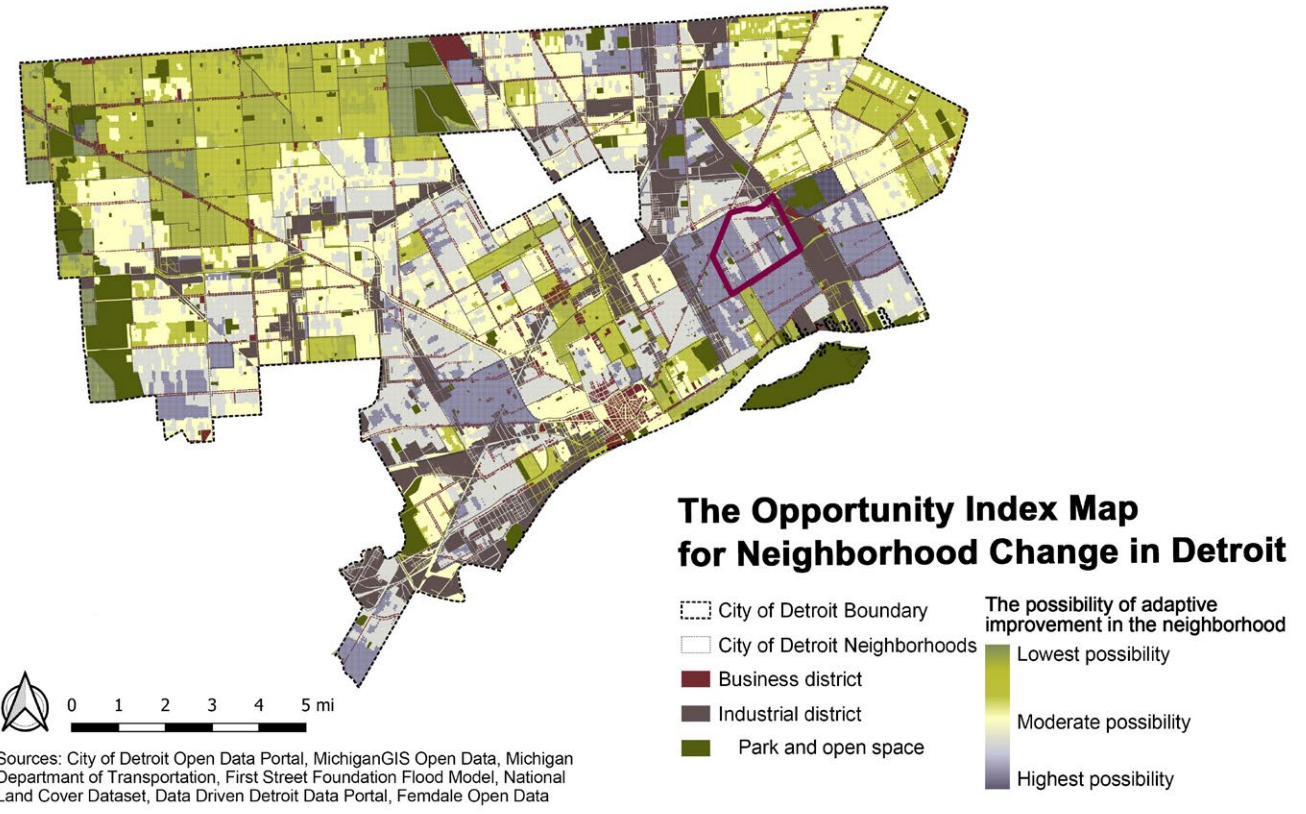
9 Social Advantage Index Map



8 Housing Stability Index Map



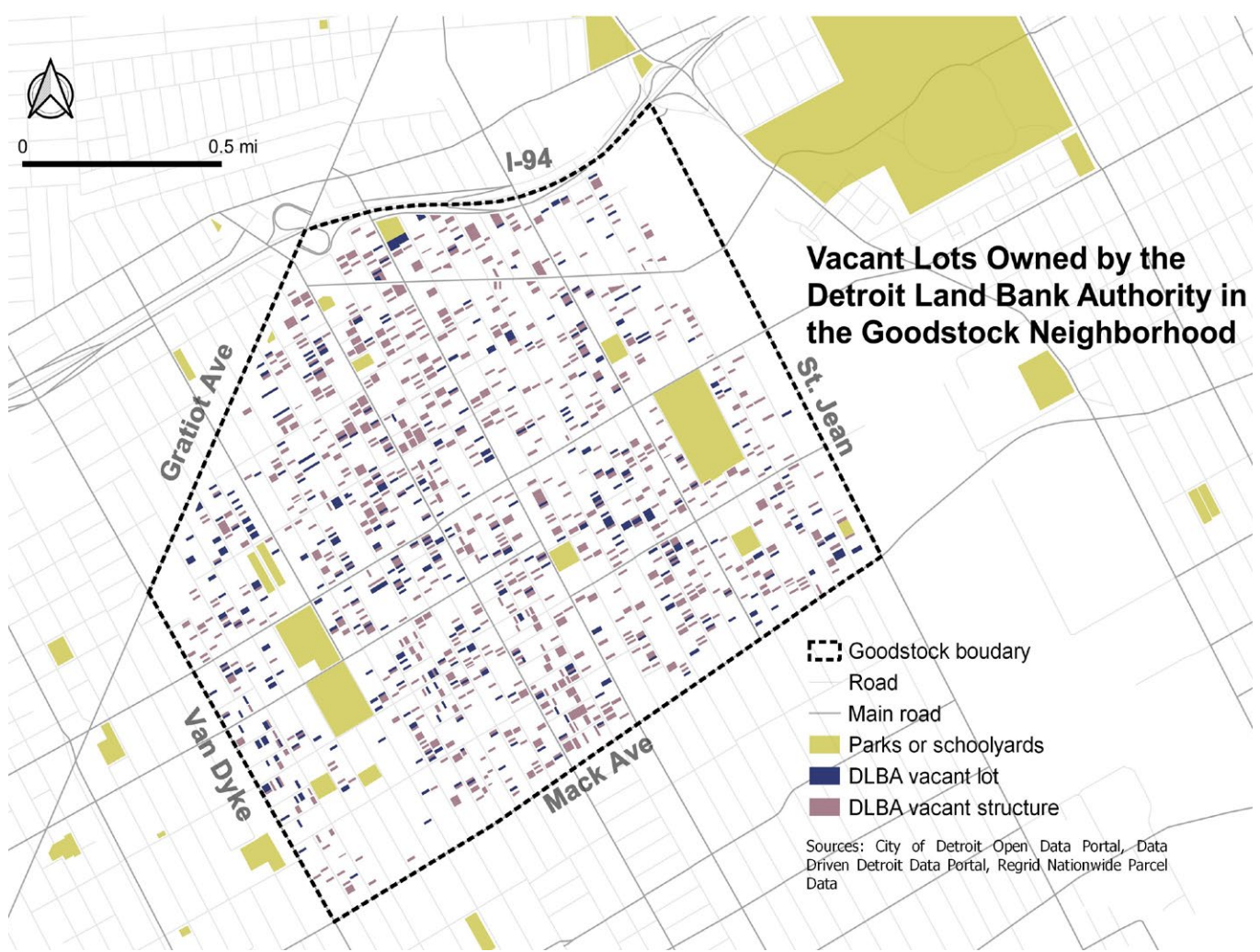
10 The Opportunity Index Map for Neighborhood Change





# COMMUNITY ANALYSIS

## DLBA Lot Ownership



Vacancy rates in the Goodstock Neighborhood are relatively high. As of 2020, there are 8,777 vacant parcels in the Goodstock Area, 18% of which belong to the Detroit Land Bank Authority. The vast majority (99%) are residential vacant parcels, and 27% of the buildings on vacant parcels have been completely demolished.



DLBA vacant lot  
SOURCE: Google Map, 5400 McClellan Ave



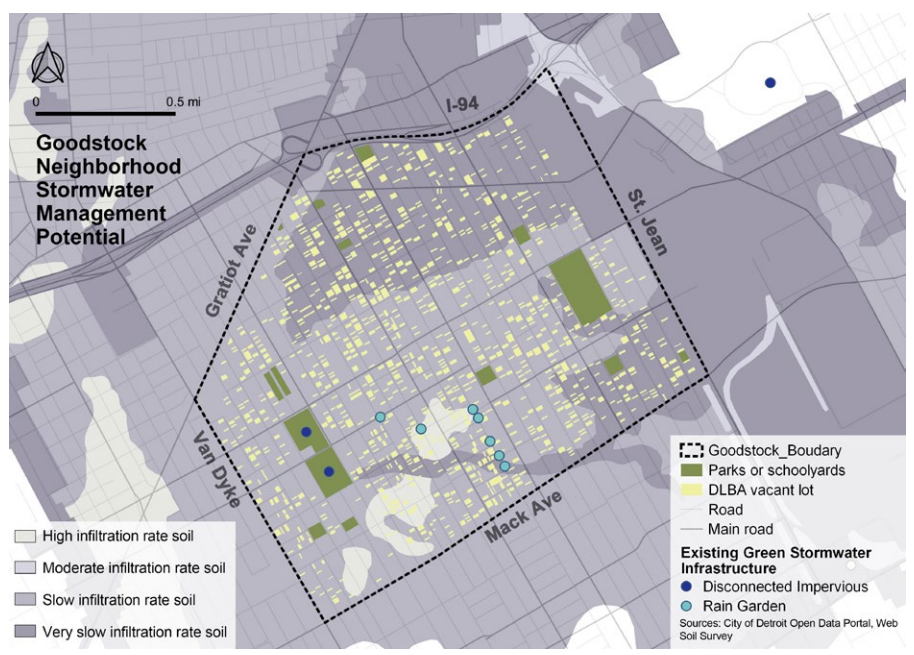
DLBA vacant structures  
SOURCE: Google Map, 5338 French Rd

## Public Open Space Service



When considering public open space, schoolyards are great options in addition to parks. The four schools in the Goodstock neighborhood have large green spaces that can be used for community recreation. Even with these schoolyard and larger parks, there are still areas within Goodstock where additional green space could be vital.

## Stormwater Management Potential



Terrain and soil drainage influences the potential for stormwater management. In particular, light-colored areas on the map represent high infiltration rate soil and would be prime spaces for stormwater infiltration like rain gardens. The rest of Goodstock is dominated by soil with slow infiltration rates, indicating that these areas may be more suitable for stormwater retention and detention.



# Engage

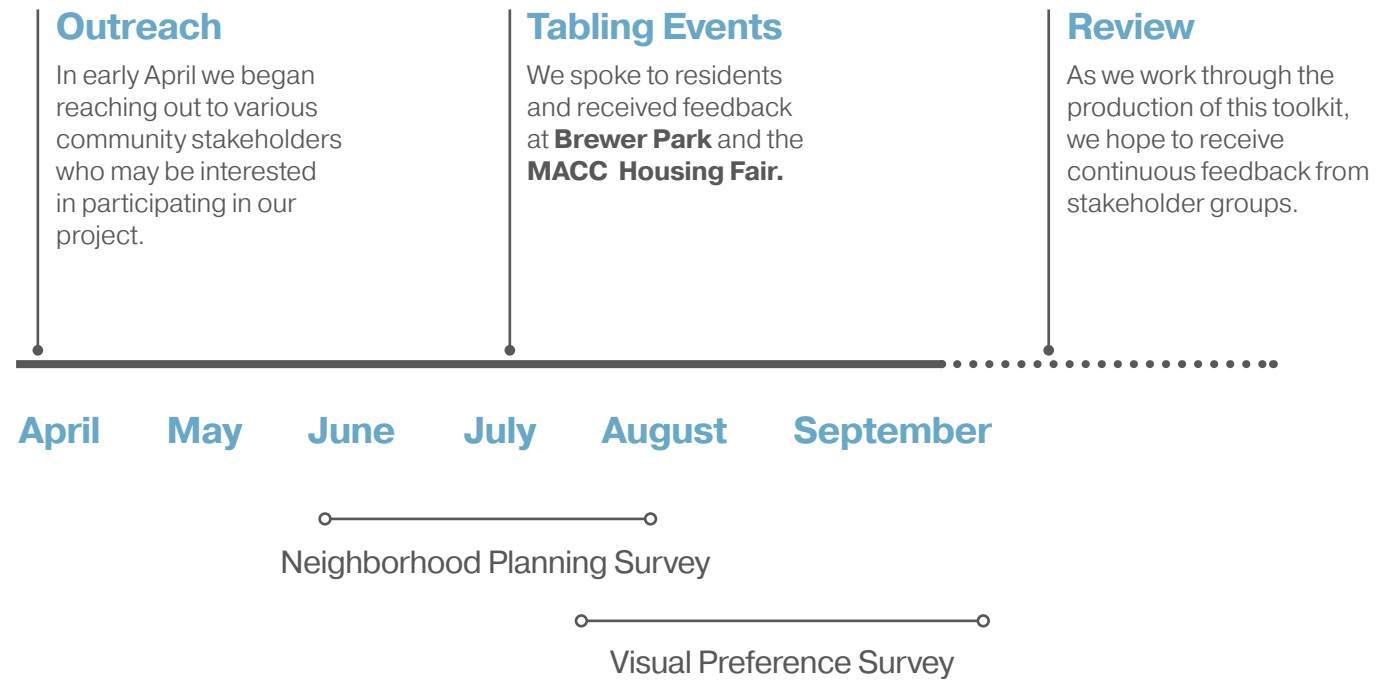
Direct communication with and input from Detroit residents is paramount in the creation of this project. Our community engagement timeline begins in early April with stakeholder outreach and initial communication. During this time, the team also prepared our first survey, ordered promotional materials (seed packets with our websites QR code), and set up the website on which our surveys would be posted.

Between the months of June and September, two surveys were published and promoted; the initial neighborhood planning survey and the more design oriented visual preference survey. The

team was also able to receive important insight from community members at various tabling events in Detroit over the summer months.

Due to the COVID-19 pandemic, in-person engagement was kept to a minimum, but the team was still able to receive almost 200 responses in total from various surveys and conversations. The most informative of these results are presented here, but you can find a complete survey breakdown in the appendix of this book.

### TIMELINE:



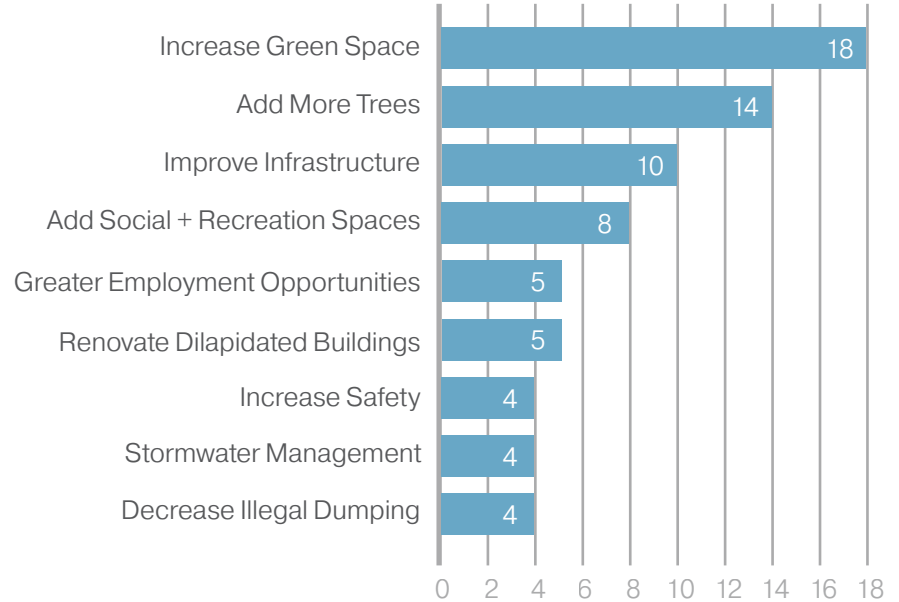
## NEIGHBORHOOD PLANNING SURVEY

**Responses: 116**  
**Type: Online**

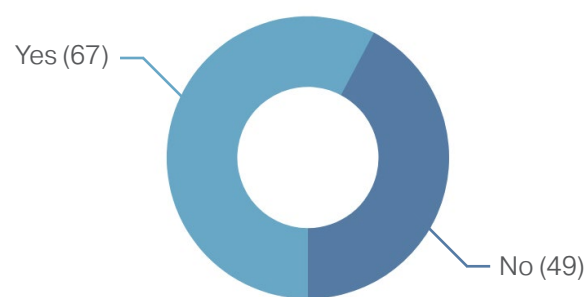
In order to inform future community engagement, the SEAS Master's Project Team developed a Neighborhood Planning Survey. The purpose of this survey was to better understand how the residents of Goodstock and the surrounding areas perceive their neighborhood and to allow us to begin considering the positive changes that are most important to the community. The survey was a mix of multiple choice, rating, and short answer questions.

The largest age group of participants (44%) was between the ages of 18-29 with a 60-40 breakdown of male to female participants. The vast majority of participants (77%) have lived in their neighborhood for more than 10 years.

What do you think needs to happen to make Goodstock and its surrounding neighborhoods proud in the future?  
[Short answer question]

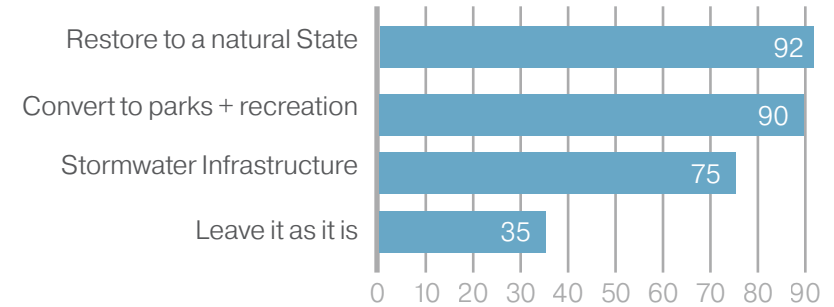


Does your neighborhood ever experience effects of extreme weather?  
[Multiple choice question with short answer follow-up]



Of those who said yes, most has experienced flooding and/or polluted air.

What would you like to see happen with the open space in your neighborhood?  
[Multiple choice question, select all that apply]



## TABLING EVENTS

**Responses: 20**  
**Type: In-Person**

The Greenprint Detroit team was represented at two tabling events (Brewer Park and the MACC Housing Fair) where the team was able to gain insight and receive feedback from Detroit residents on vacant land adaptation. We also handed out our promotional seed packets with a QR code to our surveys.

Many residents spoke about their concern for safety in public spaces and how we can create safe spaces for community members, with specific concern for young women. We also received comments concerning food security and how much residents really appreciate community gardens but have issues with ownership and upkeep.



Table at Brewer Park event



Pomotional seed packets



Word cloud adapted from tabling event word count.

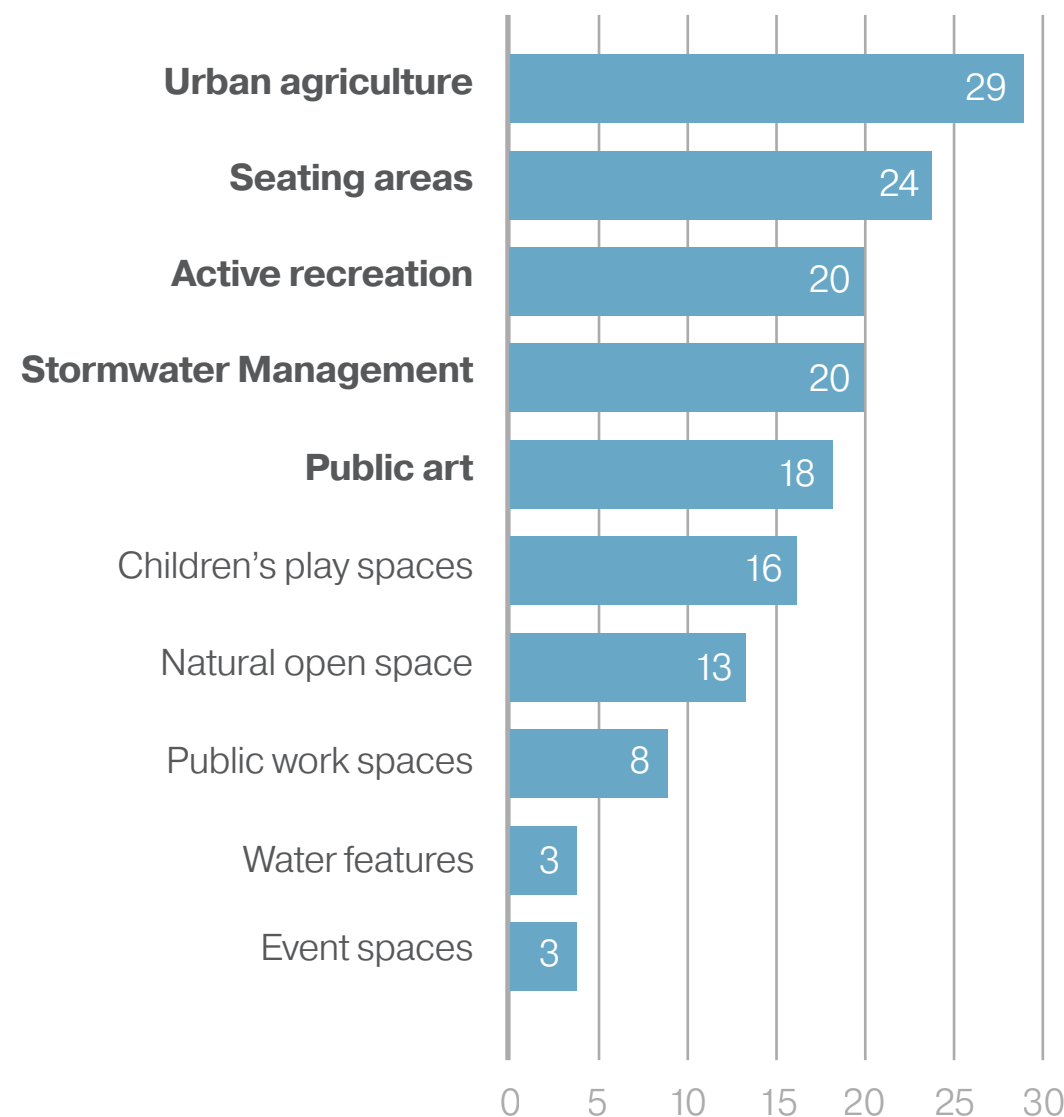
## VISUAL PREFERENCE SURVEY

**Responses: 51**  
**Type: Online + In-Person**

The purpose of the visual preference survey is to understand what residents of Goodstock and Detroit as a whole are looking for in their communities. This is done by rating certain design elements and spaces based on visual preference and perceived need. These rankings became our basis of decision making for future land-use typologies.

The largest age group of participants (67%) was between the ages of 18-29 with a 42-42-16 breakdown of male, female, and non-binary participants. For this survey, only 20% of participants have lived in their neighborhood for more than 10 years.

Please select the top 3 most important features that you would like to see incorporated into your community.





# VISUAL PREFERENCE SURVEY

## Top 5 Land-Use Features

For each of the features listed in the previous graph, residents were shown four distinct photos and asked to choose the one that they could see best fitting in their community. The results of the top five (5) land-use features are shown below. These are urban agriculture, community seating areas, spaces for active recreation, stormwater management, and public art.

The results of this survey, both the most valued features and the scenes chosen for visual appeal, were greatly considered in the example lot designs and land-use typologies showcased later in the toolkit section of the booklet.

### Urban Agriculture

87% - want it  
13% - don't want it

Of the participants of this survey, almost 50% chose option three as best fitting in their community. The image shows a community flower garden in Detroit that not only provides fresh cut flowers for residents, but aids in beautifying the community.



### Community Seating Areas

87% - want it  
04% - don't want it

Option four was chosen by the majority of participants at just 34%, while option one came in very close second at 30%. Option four shows interactive seating in the form of swings, while option one is a more traditional seating wall.



### Active Recreation

83% - want it  
04% - don't want it

45% of respondents chose option two as best fitting into and enhancing their community. The image shows Detroit youth participating in a game of basketball on what looks like a newly renovated court.



### Stormwater Management

85% - want it  
11% - don't want it

Almost 50% of survey participants chose option one as something they would like to see more in their community. The option chosen shows a heavily vegetated residential rain garden in full bloom.



### Public Art

87% - want it  
13% - don't want it

Over half (54%) of the survey responders chose option two as something they could see enhancing their community. The option shows a Detroit mural that is both beautiful and inspiring.





# TOOLKIT

# Decision Making Tool

**/01 side lot**

A side lot is a lot adjacent to your house.

house  
side lot

Alley  
Street

[learn more on page 32](#)

**/02 accessory structure lot**

An accessory structure lot is a lot with a structure adjacent to your house.

house  
accessory lot  
other potential purchase

Alley  
Street

[learn more on page 34](#)

**/03 oversize lot**

An oversize lot is a larger lot on the street adjacent to your house.

house  
oversize lot

Alley  
Street

[learn more on page 38](#)

**/04 neighborhood lot**

A neighborhood lot is within 500ft of your house.

house  
neighborhood lot

Alley  
Street

[learn more on page 40](#)

**/05 infill lot**

An infill lot is used for new housing development.

infill lot

Alley  
Street

[learn more on page 42](#)

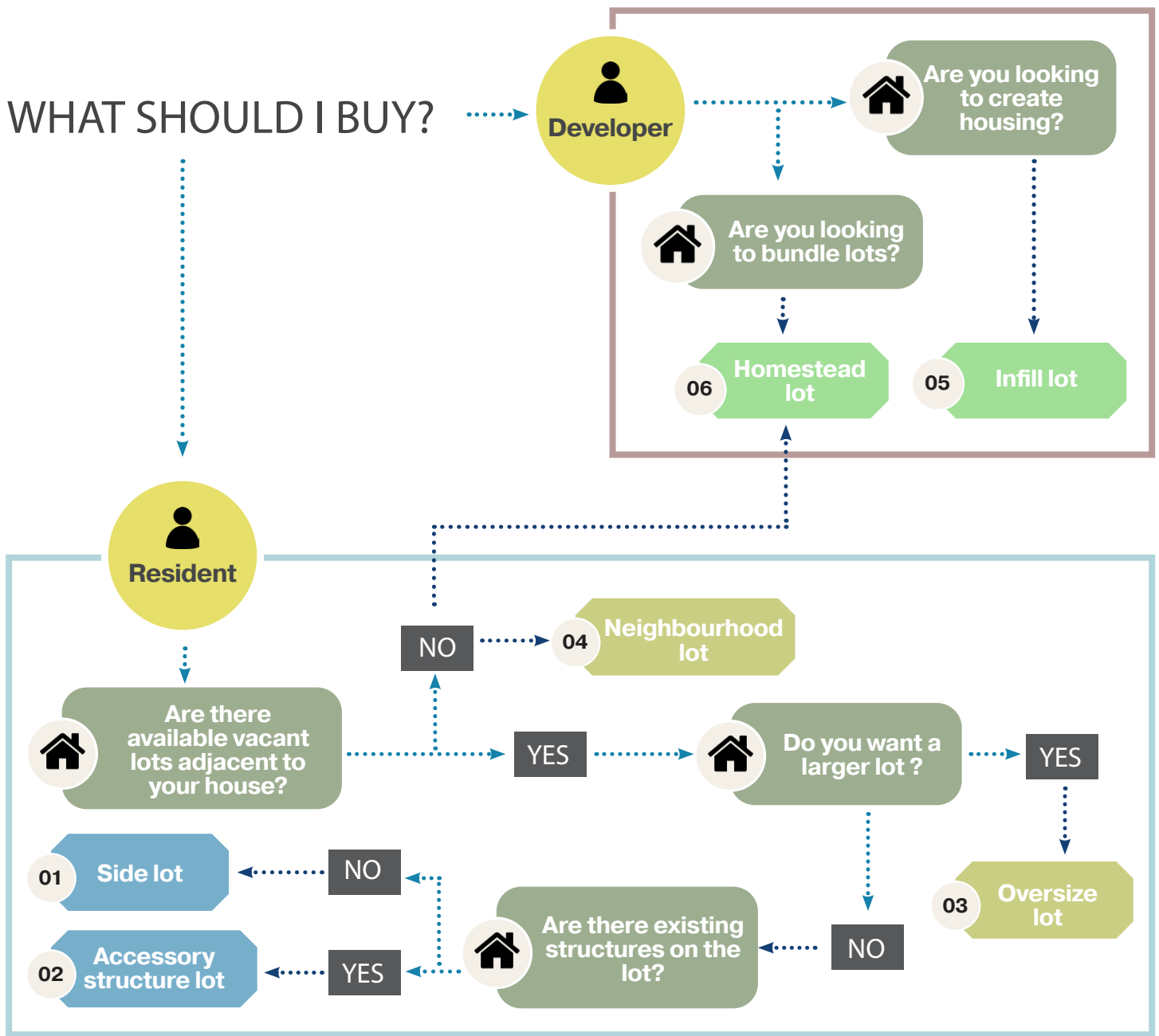
**/06 homestead lot**

A homestead lot is 1-5 vacant lots adjacent to a residential lot.

residential lot  
homestead lot

Alley  
Street

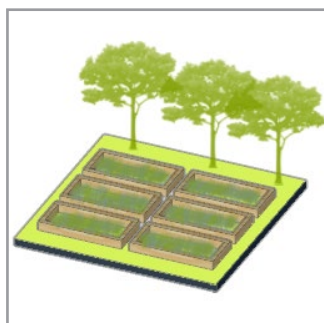
[learn more on page 44](#)



	size requirements(sqft)	maximum numbers	price (\$)	location requirements	zoning requirements
<b>side lot</b>	< 7500		100	adjacent to your house	residential
<b>accessory structure lot</b>	<7500		250	street adjacent to your house	residential, recreational, or agricultural
<b>oversize lot</b>	7500 < lot < 15000	1	200	street adjacent to your house	
<b>neighborhood lot</b>	< 7500	2	250	within 500 ft to your house	
<b>infill lot</b>	< 15000	2		in an Inclusive Housing Opportunity Area	residential
<b>homestead lot</b>		5	100		

# Opportunities

## PRODUCTIVE

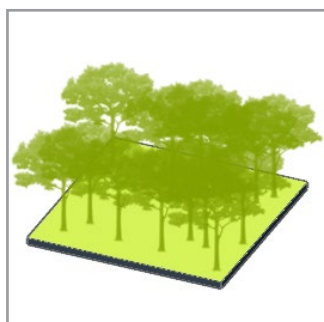


### URBAN AGRICULTURE

Turning vacant land into urban agricultural space can be beneficial for many reasons, but mostly that it improves access to healthy, affordable locally produced food in and around the community.

**Cost.** \$

**Maintenance.:** Low

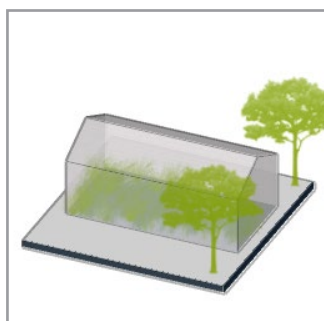


### ORCHARD

An orchard is the intentional planting of trees or shrubs that is maintained for food production. Orchards can serve aesthetic purposes and also sequester carbon.

**Cost.** \$

**Maintenance.:** Medium

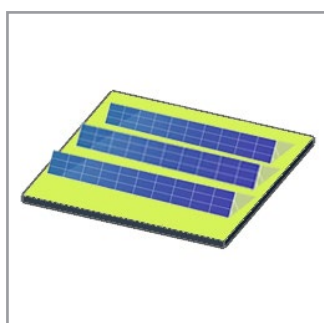


### GREENHOUSE

A greenhouse is a great method of growing all-season crops and gardening. It helps increase yields and offers multiple benefits in terms of weather protection and pest control.

**Cost.** \$\$

**Maintenance.:** Medium



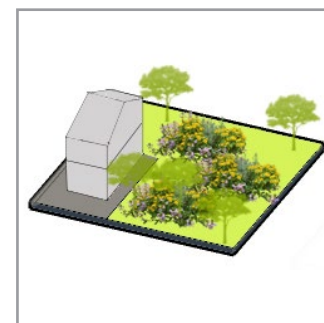
### SOLAR PANELS

Introducing solar panels on your lot can decrease electricity costs and provide clean, renewable energy for your home. They can also increase home value!

**Cost.** \$\$\$

**Maintenance.:** Medium

## ENVIRONMENTAL

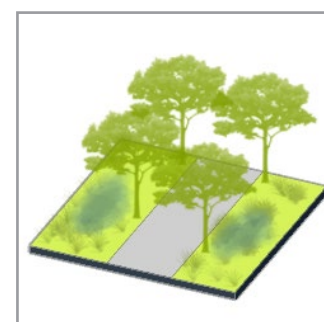


### POLLINATOR HABITAT

Pollinator habitats provide an important food source for pollinators such as birds and butterflies. Colorful flowers attract pollinators and make our gardens so beautiful!

**Cost.** \$

**Maintenance.:** Low

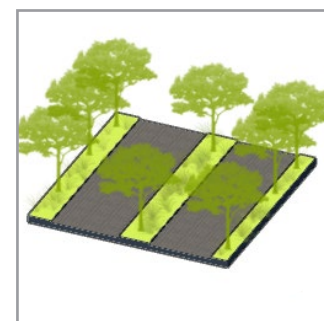


### STORMWATER MANAGEMENT

Green stormwater infrastructure can play a remarkable role in stormwater management and flooding control. These can include rain gardens, detention ponds, and other management options.

**Cost.** \$\$

**Maintenance.:** Medium

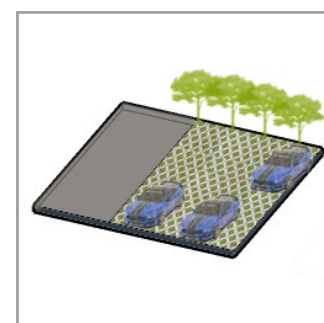


### GREEN BUFFER

Even small, typically unusable, space can be environmentally beneficial. Small lots can be used as green strips or buffers for privacy.

**Cost.** \$\$

**Maintenance.:** Low



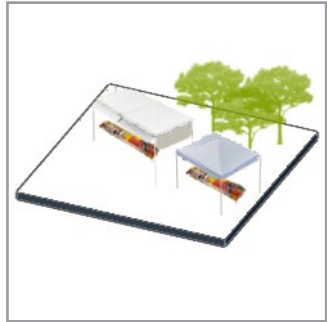
### PERMEABLE PAVEMENT

Permeable pavers are made of materials that allow stormwater to flow through. This aids in stormwater management and also decreases amounts of concrete and asphalt that cause urban heat islands.

**Cost.** \$-\$\$\$

**Maintenance.:** Medium

# SOCIAL

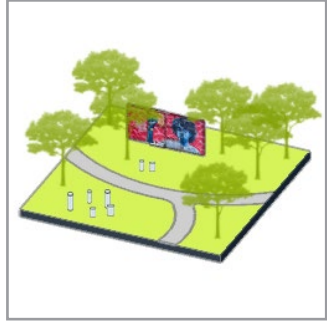


## FARMERS MARKET

A farmers market provides a space to support small farmers and businesses. They also increase access to healthy fruits and vegetables in your neighborhood and encourage social interaction.

**Cost.** \$

**Maintenance.:** Medium

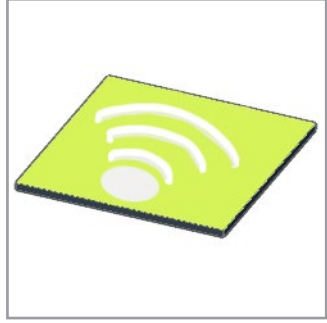


## PUBLIC ART

Studies show that through their programming and other activities, art spaces serve various public space roles related to community development.

**Cost.** \$ - \$\$\$

**Maintenance.:** Low

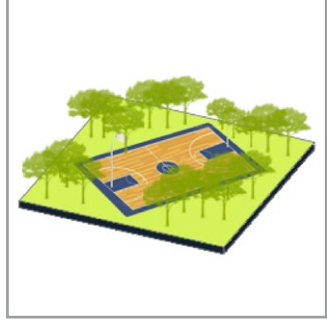


## GATHERING SPACE

Performance and other gathering spaces encourage social and civic engagement while providing a platform for community interaction.

**Cost.** \$\$

**Maintenance.:** Medium



## ACTIVE RECREATION

Recreational facilities help create strong social bonds as well as encourage health and wellness within the community. Sports and recreation build stronger, healthier, and happier communities.

**Cost.** \$-\$\$\$

**Maintenance.:** Medium



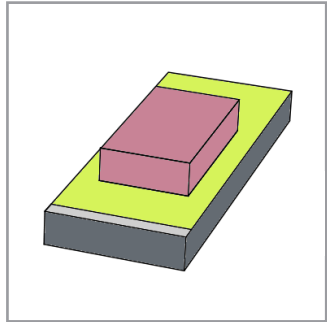
## PLAYGROUND

Playground are vastly important for development and the socialization of children. They are also vital for creating inter-generational interaction and many other mental health benefits.

**Cost.** \$\$\$

**Maintenance.:** Medium

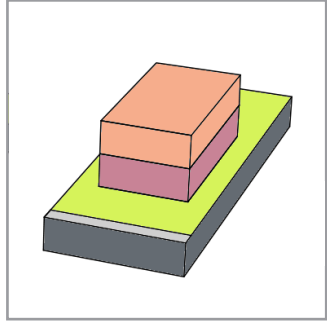
# DEVELOPMENT



## SINGLE FAMILY HOME

A single-family home is a free-standing residential building. Single-family homes are designed to be used as a single-dwelling unit, with one owner, no shared walls, and its own land.

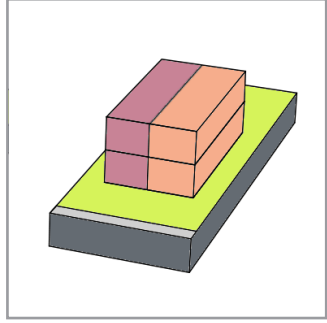
**Units.** 1



## DUPLEX 1

A duplex is a house divided into two apartments, with a separate entrance for each. For this example, each floor is a separate apartment.

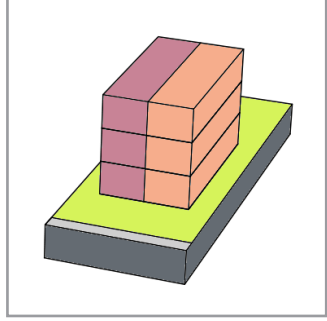
**Units.** 2



## DUPLEX 2

Similarly to the above option, this is also a house divided into two apartments with separate entrances. This development however, is divided in half where each unit has two floors.

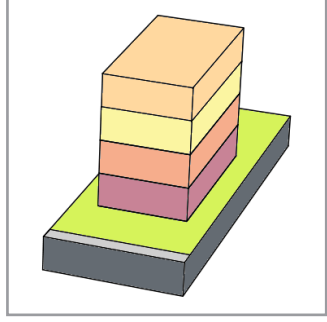
**Units.** 2



## TOWNHOUSE

A townhouse is a modern multi-story house which is attached to one or more similar houses by shared walls. Due to the skinny nature of these homes, they often encompass 3 or more floors.

**Units.** 2



## BOUTIQUE APARTMENT

Boutique Apartments have small footprints with increased functionality. This is perfect for young professionals looking for a space to make their own. Each floor represents a different unit.

**Units.** 4



# Side Lots

### Purpose.

To sell DLBA-owned vacant lots to owners of Adjacent occupied residential property to be used for residential, recreational or agricultural purposes.

### Requirements.

The lot must be a vacant residential property without structure. It must not exceed 7,500 square feet in size and cannot measure more than 300 linear feet on any side.

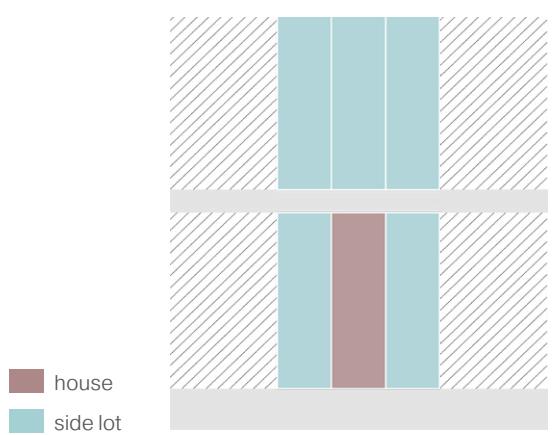
### Notes:

The lot must be adjacent to an applicant's property that contains an occupied residential structure of 1-4 units.

There must be no delinquent or currently due property taxes in connection with the lot.

The lot must (a) be zoned residential. If it is not, the DLBA may choose to make it eligible as a Side Lot if the lot's most recent previous use was as a 1-4 unit residential structure.

The lot must not be selected for another DLBA disposition program.



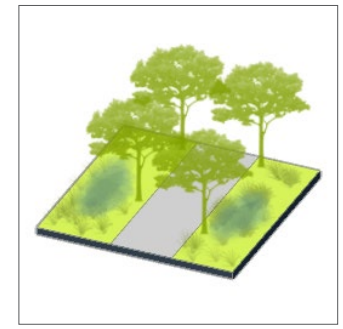
house  
side lot

The design on the right places an emphasis on both social interaction experience and ecological well being. The pavilion provides a space for communication and gathering; Detention pond is placed to facilitate flooding control and urban agriculture is promoted to encourage local production.

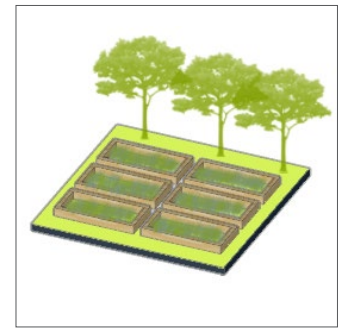
## PRODUCTIVE SIDE YARD

SITE: 5722 CRANE STREET

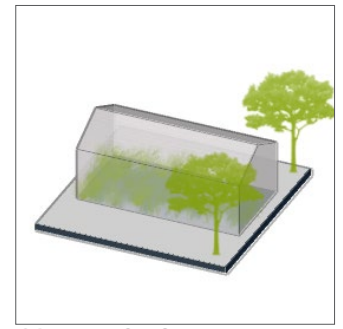
Designs Used:



STORMWATER MANAGEMENT



URBAN AGRICULTURE



GREENHOUSE

### STORMWATER MANAGEMENT

A retention pond is placed at the back of the property for maximum stormwater infiltration.

### PARK

This gathering space offers the opportunity for social connection in a beautiful setting.

### GREENHOUSE

The greenhouse will allow for all-season crop production. It also helps with weather protection and pest control.

### URBAN AGRICULTURE

These vegetable gardens will help improve access to healthy, affordable, locally produced food and are a great source of education for youths.



Lots in Goodstock, Detroit  
Photo by team member



Lots in Goodstock, Detroit  
Photo by team member



# Accessory Structure Lots

### Purpose.

To sell DLBA-owned lots improved by only one or more accessory structures to owners of Street Adjacent occupied residential property to be used for residential, recreational or agricultural purposes.

### Requirements.

Determined by the DLBA and may include, among other structure types, garages, sheds, gazebos, or carport.

See Appendix A for more information on other Allowable Uses and Structures on Urban Gardens and Urban Farms.

### Purchase Options.

- Option 1:
- Purchase 1 blue accessory lot (No.1 or 2) on either side of the property
  - Buy green lot (No.3 or 4) next to blue lot
- Option 2:
- Purchase 2 blue accessory lot (No.1 and 2) next to the property
  - Buy 1 green lot (No.3 or 4) next to any blue lots
  - Buy 2 green lot (No. 3 and 4) next to the blue lots

### Notes:

There is no Accessory Structure Lot in Goodstock neighborhood. But accessory structures can be built on vacant lots. The most common accessory structure in Goodstock is the garage, usually behind the main building.



FIG.1 GARAGE



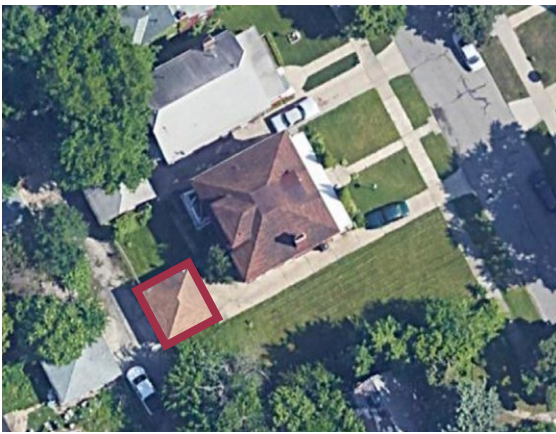
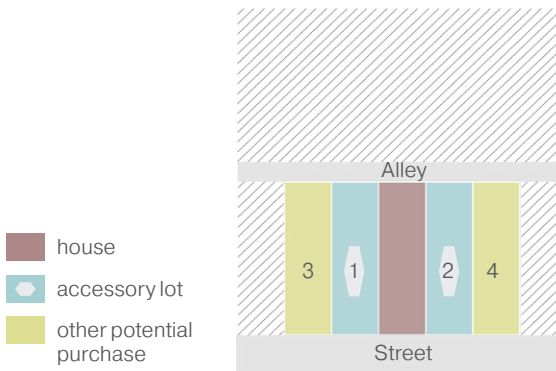
FIG.2 SHEDS



FIG.3 GAZEBO



FIG.4 CARPORT



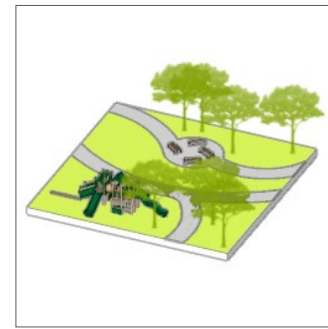
The garage behind the house  
SOURCE: Google Map, 5029 Seneca St

FIG. 1: <https://onedaygarage.com/>  
 FIG. 2: 10 Considerations When Buying Outdoor Storage Sheds  
 FIG. 3: Oval Gazebos & Accessories at Lowes.com  
 FIG. 4: <https://www.ambienhomeus.com/>  
 FIG. 5: <https://playgroundideas.org/>  
 FIG. 6: <http://www.earthartist.com/>  
 FIG. 7: <https://www.localbouncycastle.com/>  
 FIG. 8: <https://www.spokesman.com/>  
 FIG. 9: <https://www.ofdesign.net/>  
 FIG. 10: <https://commons.wikimedia.org/>

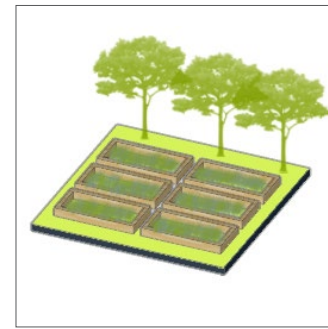
## ACCESSORY STRUCTURE LOT - SINGLE

PURCHASE 1 BLUE LOT ON EITHER SIDE OF THE PROPERTY  
SITE: 3852 LEMAY ST

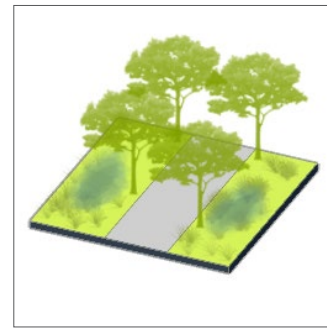
### Designs Used:



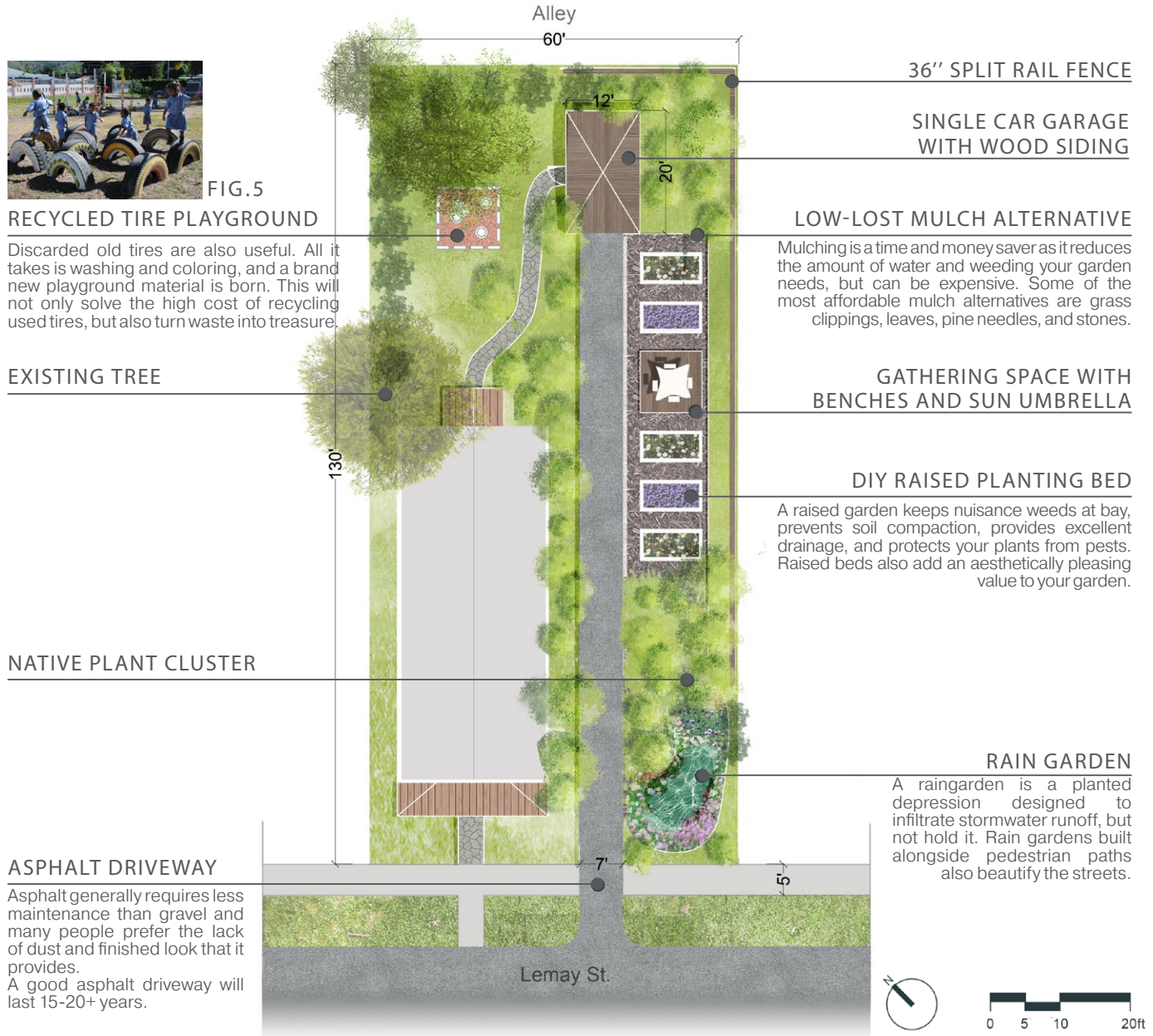
PLAYGROUND



URBAN AGRICULTURE



STORMWATER MANAGEMENT

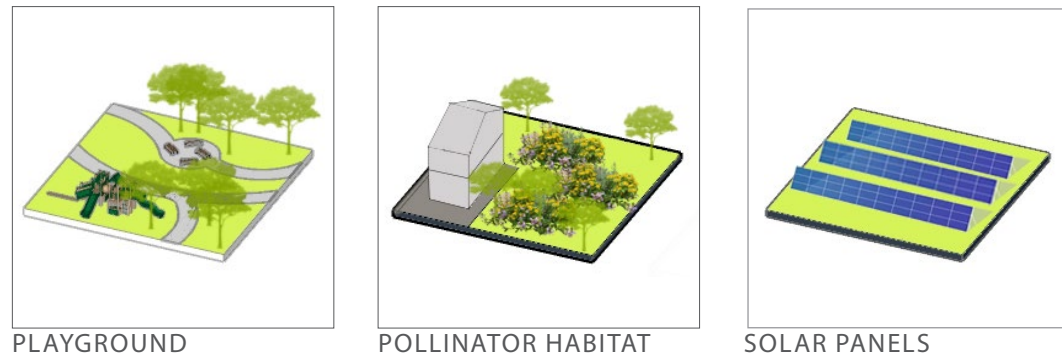




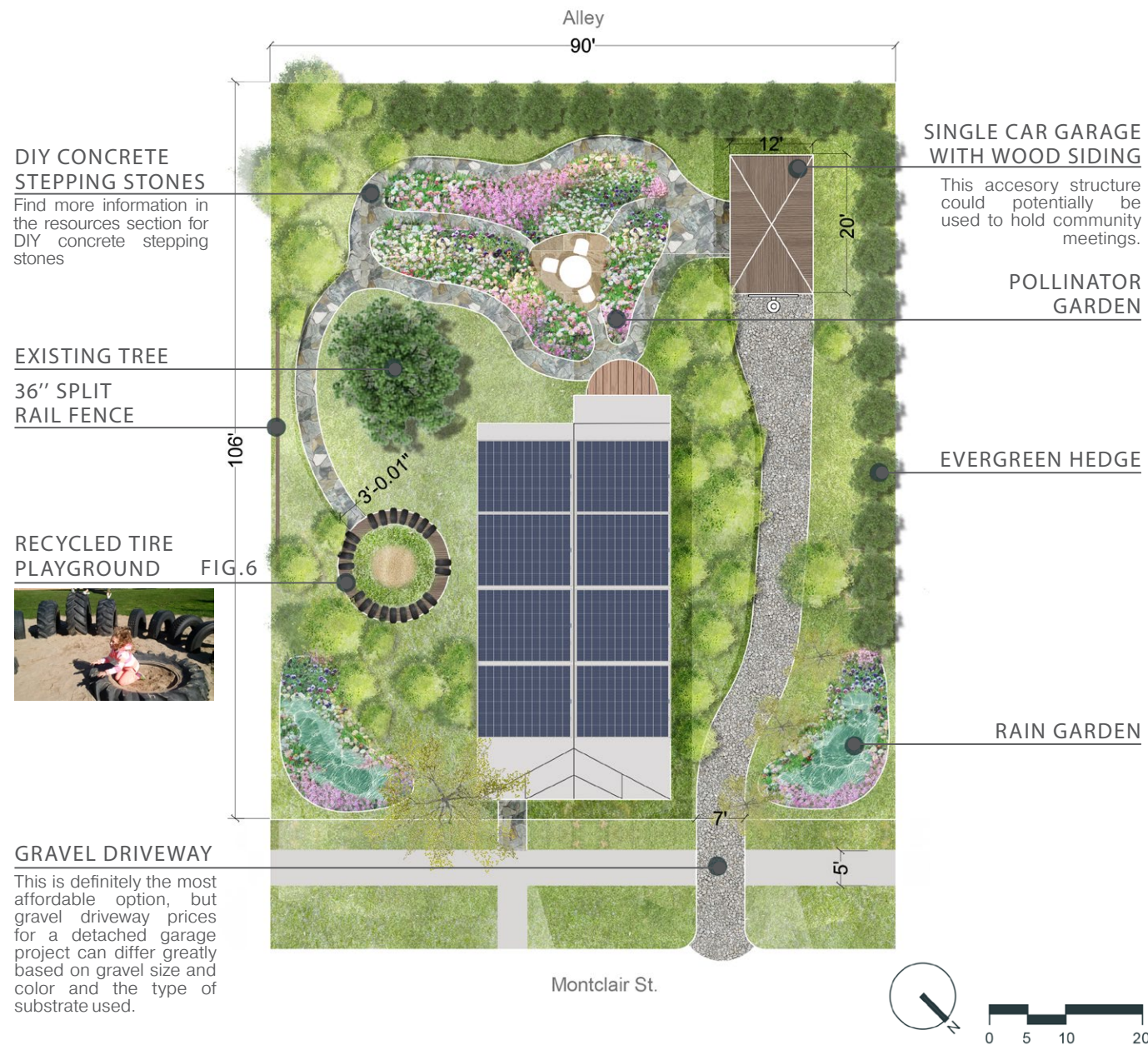
# ACCESSORY STRUCTURE LOT - BOTH SIDES

PURCHASE 2 BLUE LOTS NEXT TO THE PROPERTY  
SITE: 4465 MONTCLAIR ST

Designs Used:



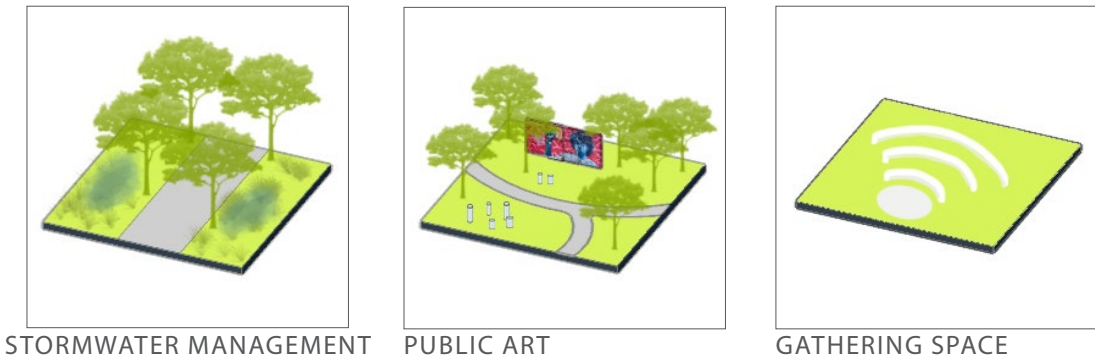
PLAYGROUND POLLINATOR HABITAT SOLAR PANELS



# ACCESSORY STRUCTURE LOT - MERGED

BUY GREEN LOT NEXT TO GREEN LOT  
SITE: 5361 PENNSYLVANIA ST

Designs Used:



STORMWATER MANAGEMENT PUBLIC ART GATHERING SPACE





# Oversize Lots

### Purpose.

To sell DLBA-owned vacant lots that are larger than traditional Side Lots to owners of Street Adjacent occupied residential property to be used for residential, recreational or agricultural purposes.

### Requirements.

An "Oversize Lot" is defined as a residential parcel of property in the DLBA's inventory that are greater than 7,500 square feet and less than or equal to 15,000 square feet in size and it must not measure more than 400 linear feet on any side.

### Purchase Options:

Oversize lots are priced at \$200 per lot, unless the estimated value of the lot exceeds \$2,500 in which case the sales price will be determined pursuant to the projects procedures and guidelines.

### Notes:

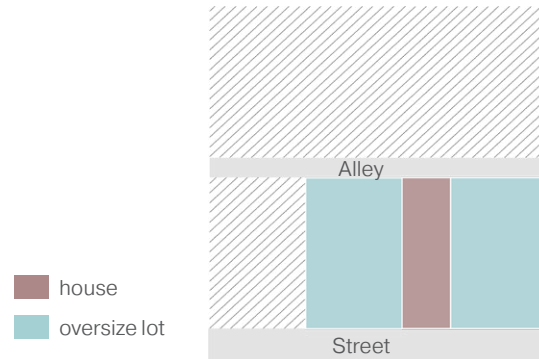
The lot must be a vacant residential property without a structure.

The lot must be Street Adjacent to the Applicant's Occupied Property.

There must be no delinquent or currently due property taxes in connection with the lot.

The lot must not be selected for another DLBA disposition program.

All Oversize Lot listings must be approved by staff of the appropriate City planning agencies and, if applicable, any other appropriate governmental agency.

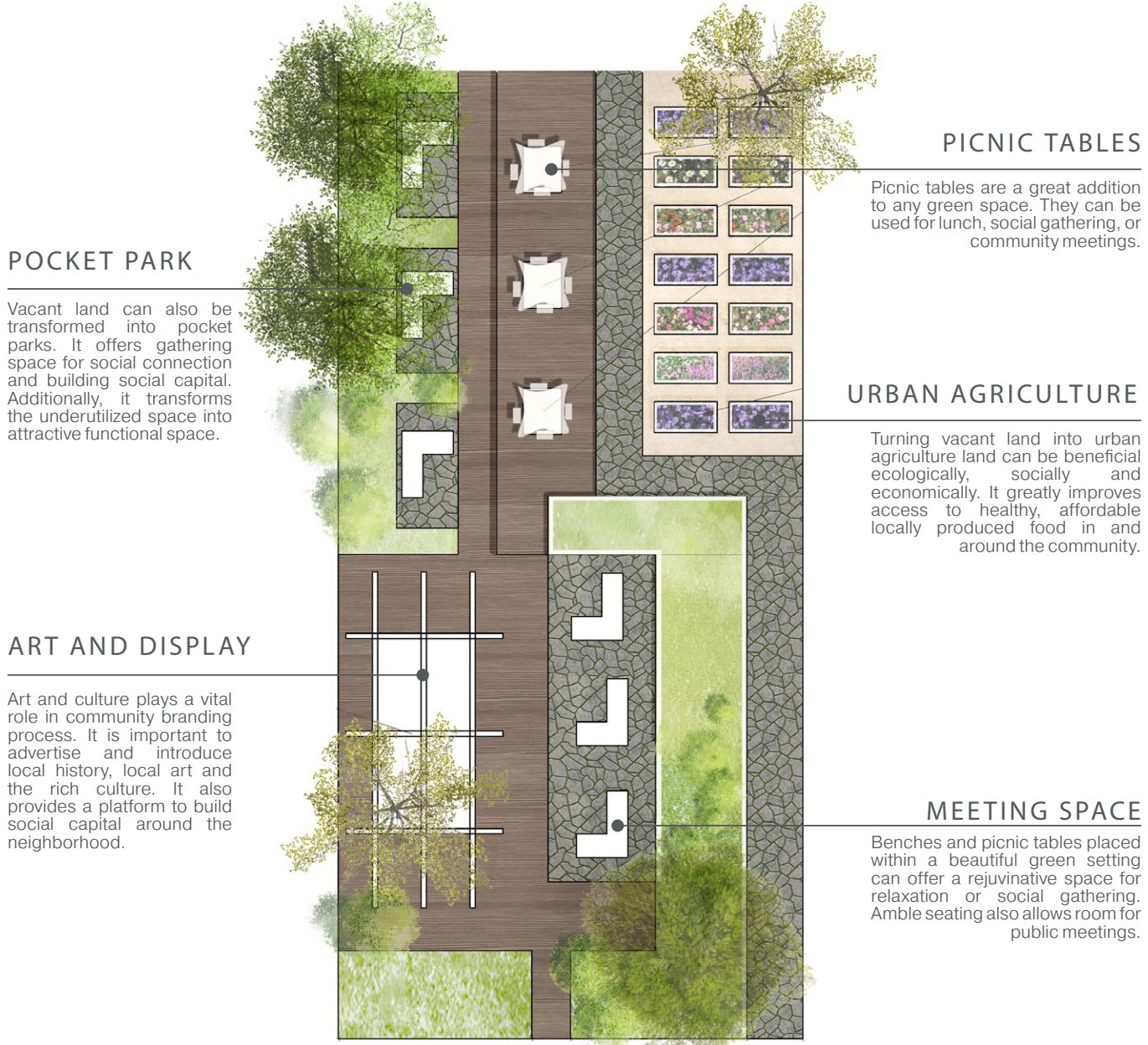
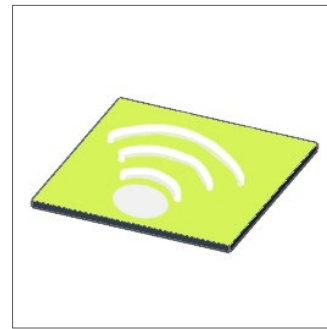
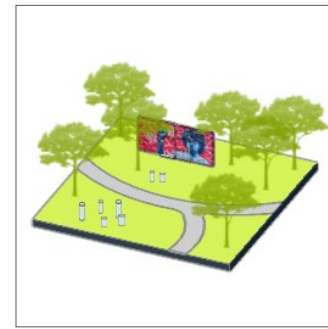
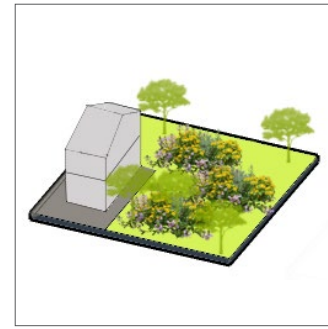


The design depicted on the next page aims to provide exceptional social interaction experience, ecological well being as well as mental restoration functionality with well curated native plantings. The outdoor seating area surrounded by perennial garden provides extraordinary view and experience for communication and gathering; Art gallery is placed for art display and community collaboration.

## COMMUNITY HAVEN

SITE: 916 E GRAND BLVD.

### Designs Used:



### POCKET PARK

Vacant land can also be transformed into pocket parks. It offers gathering space for social connection and building social capital. Additionally, it transforms the underutilized space into attractive functional space.

### ART AND DISPLAY

Art and culture plays a vital role in community branding process. It is important to advertise and introduce local history, local art and the rich culture. It also provides a platform to build social capital around the neighborhood.

### PICNIC TABLES

Picnic tables are a great addition to any green space. They can be used for lunch, social gathering, or community meetings.

### URBAN AGRICULTURE

Turning vacant land into urban agriculture land can be beneficial ecologically, socially and economically. It greatly improves access to healthy, affordable locally produced food in and around the community.

### MEETING SPACE

Benches and picnic tables placed within a beautiful green setting can offer a rejuvenative space for relaxation or social gathering. Amble seating also allows room for public meetings.



# Neighborhood Lots

**Purpose.** To sell DLBA-owned vacant lots to owners of nearby occupied residential property to be used for residential, recreational or agricultural purposes.

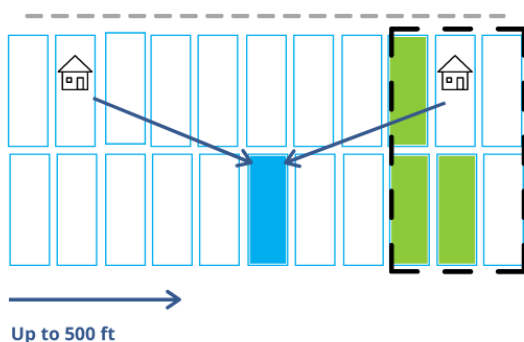
**Purchaser Eligibility.**

- (1) A brief plan for purchaser's proposed use of the lot .
- (2) No person, directly or indirectly, may ever purchase in total more than 2 Neighborhood Lots.
- (3) There's a three-year compliance period during which the Land Bank can regain possession of the parcel if you incur blight violations.
- (4) The purchaser shall have the endorsement of at least one of the following:
  - A local block club or a local neighborhood association, in each case registered with the City's Department of Neighborhoods;
  - A DLBA approved Community Partners in good standing; or
  - The local District-elected City Council Member or one of the At-Large City Council Members.

### How Do Neighborhood Lot works?

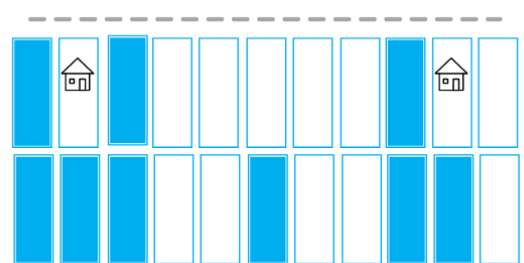
**INTRODUCING THE NEIGHBORHOOD LOT**

Any homeowner within 500ft of a designated Neighborhood Lot that submits a plan for the lot and is endorsed by a Neighborhood Lot Endorser is eligible to purchase that lot for only \$250.



**WHEN SIDE LOTS ARE PURCHASED**

The DLBA encourages all homeowners to check their eligibility for Side Lots because vacant lots in this program will only be listed for 6 months before those lots will be converted into Neighborhood Lots



**FROM SIDE LOT TO NEIGHBORHOOD LOT**

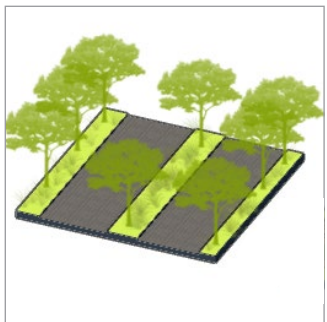
After a six month sales period, Side Lots that are not purchased by adjacent homeowners get converted into Neighborhood Lots. This means those lots become eligible to be purchased by homeowners within 500ft giving residents access to more DLBA-owned lots!

Source: Detroit Land Bank Authority Land Reuse Program

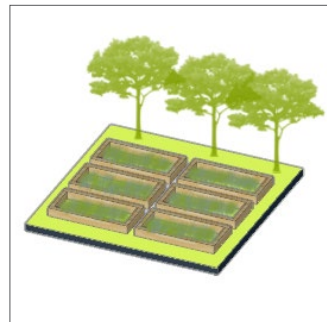
## NATIVE GARDEN

BUY 2 VACANT LOTS WITHIN 500FT  
SITE: 4451 & 4455 SEMINOLE ST

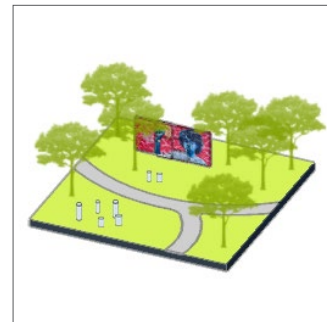
Designs Used:



GREEN BUFFER



URBAN AGRICULTURE



PUBLIC ART

**GATHERING SPACE WITH BENCHES**



**FIG.1**  
DIY CONCRETE STEPPING STONES

This is an economical way of paving. A stepping stone is any piece of stone or other material that is laid out as a path or a walkway. The types of materials used for these paths can be stone, brick, wood or concrete.

**CONCRETE SEATING**

Seating offers respite for those working in the community garden.

**NATIVE PLANT CLUSTER**

**RAIN GARDEN**



**FIG.2**  
WALL ART

Wall art is the most popular form of art creation in community engagement. Community members can create their own community art wall.

**DIY RAISED PLANTING BED**

**LOW-LOST MULCH ALTERNATIVE**

**ROLLING TOPOGRAPHY**

Can shape different feelings of space. The soil of the hills comes from rain gardens. We try to balance the graded soil expenditure within the site.

**EVERGREEN HEDGE**



FIG. 1: <https://www.instructables.com/DIY-Concrete-Stepping-Stones-That-Look-Natural/>  
FIG. 2: <https://rafaellopez.com/>





# Infill Lots

### Purpose.

To encourage the construction of new residential housing, including affordable housing, in the City. This type of lot would be most suitable for small scale nonprofit or for-profit developers as well as community housing development organizations.

### Requirements.

The vacant lot must be in an inclusive housing opportunity area and not exceed 15,000 square feet.

### Notes:

An individual may only purchase two infill lots per year.

There are many potential funding opportunities available for the purpose of affordable housing development. These can be found in the resources section.

Discounts on lot purchases are available for meeting certain AMI's, these specifications can be found in the appendix.

### SUSTAINABLE MATERIALS

#### Architectural Salvage Warehouse of Detroit

aswdetroit.org

The Architectural Salvage Warehouse of Detroit deconstructs buildings in Southeast Michigan to keep environmental resources out of the waste stream, and to make decent, affordable housing materials available to low- and moderate-income families.

#### Pivot Materials

pivot.eco

Pivot Materials is a woman owned Detroit based social impact business that is reforming the plastics industry. They specialize in manufacturing composite plastics using natural fiber bamboo or rice hull fiber. Pivot's products are light-weight, sustainable, durable, and cost competitive.

#### Reclaim Detroit

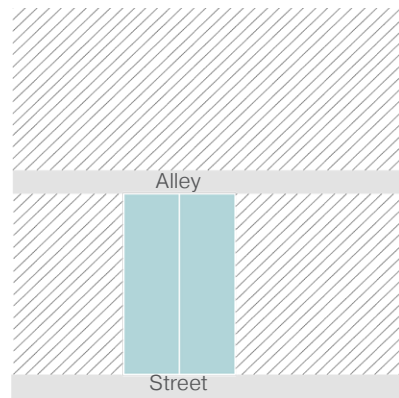
reclaim-detroit.myshopify.com

Reclaim Detroit is a non-profit organization that dismantles a building piece by piece, leaving the building's individual components in the best possible condition for re-use. The value of the salvaged materials is tax deductible, keeping costs low.



When developing a new property, the developer will have the choice of selling or renting the units out. Renting allows for a steady stream of income while selling removes the liability of owning a longterm property.

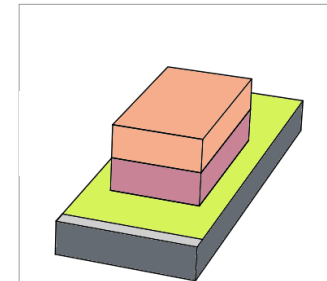
infill lot



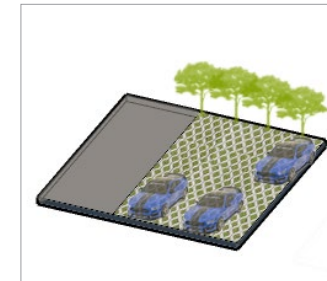
## DUPLEX DESIGN

SITE: 4768 BURNS AVE

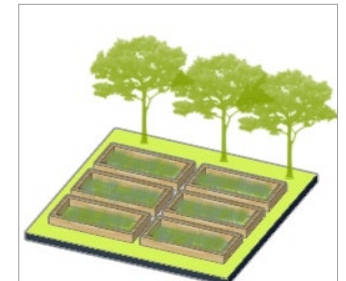
Designs Used:



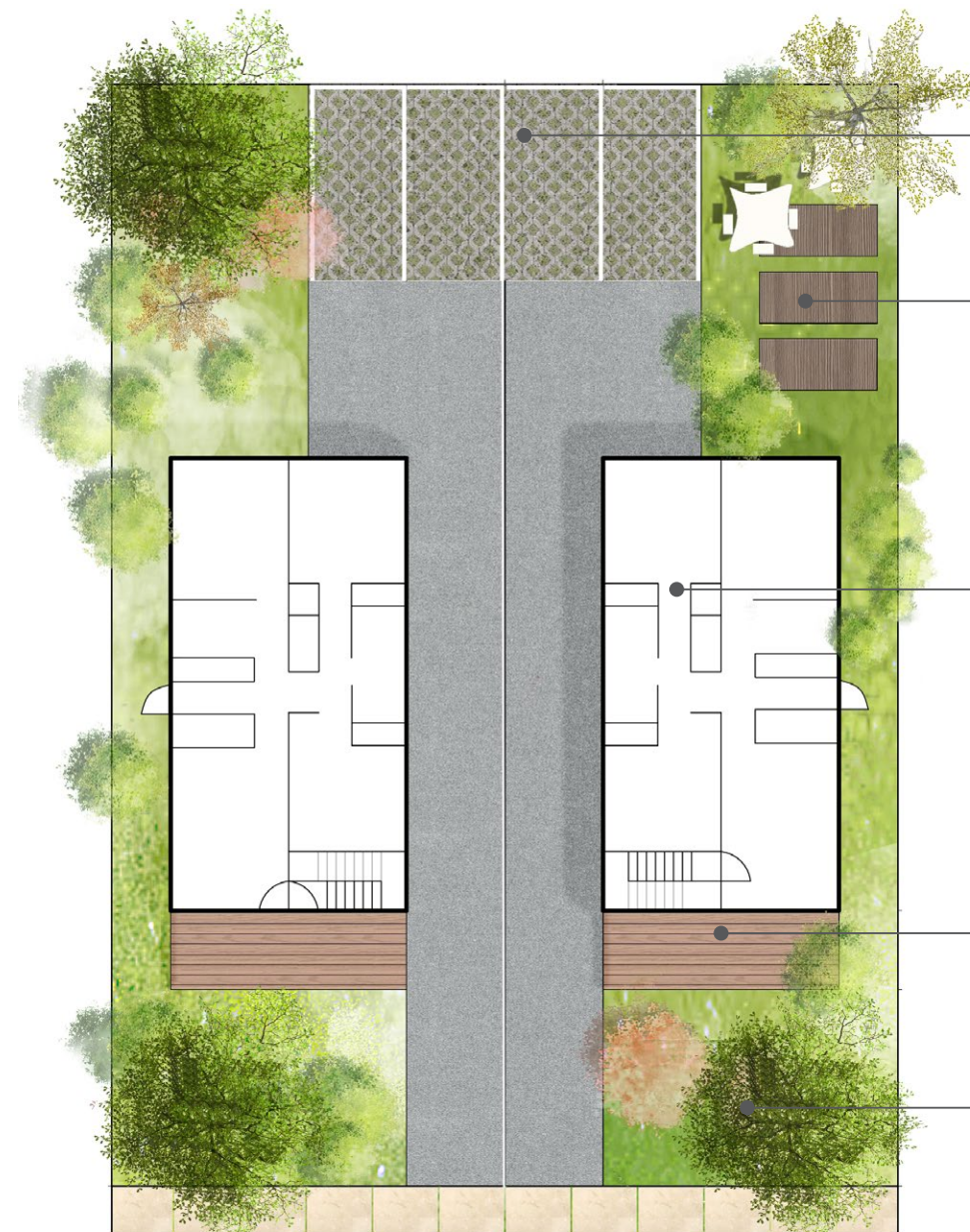
DUPLEX



PERMEABLE PAVEMENT



URBAN AGRICULTURE



#### PERMEABLE PAVERS

Permeable pavers are a great way to reduce concrete and increase stormwater infiltration.

#### VEGETABLE GARDEN

Vegetable gardens offer residents the opportunity grow their own healthy food while spending quality time outside.

#### HOUSE

The buildings shown are both 2-storey duplex homes, featuring 4 units in total at ~1,000sf each, where each unit contains 3 bedrooms and 2 bathrooms.

#### RECLAIMED WOOD DECK

Reclaimed wood is recycled from other construction projects, whether it be unused scraps or full-sized pieces from a tear-down. Unique decks can be made from reclaimed wood materials.

#### SHADE TREES

Planting trees in your front yard can help block your home from direct sun and can increase curb appeal.





# Homestead Lots

### Purpose.

Homestead lots are DLBA-owned lots which are sold together with DLBA-owned residential properties. These sale bundles are sold to purchasers for future occupancy.

### Requirements.

Homestead lots must be adjacent to a DLBA-owned residential property that includes an existing residential structure of 1-4 units or part of a contiguous assemblage of Homestead Lots that are Adjacent to such a property.

### Notes:

Homestead lots are sold with residential lots. A maximum of five lots can be sold at a time to any individual.

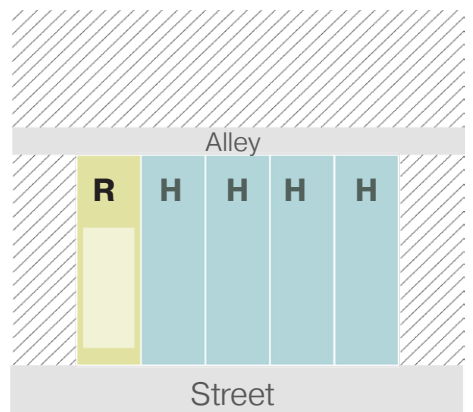
These lots are typically priced at \$100 each.



Lots in Goodstock, Detroit



Lots in Goodstock, Detroit



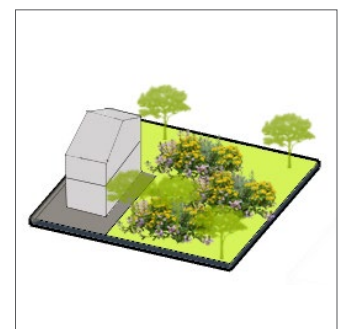
### HOW TO BUY?

- 1. buy a Residential lot
- 2. buy 1~4 Homestead lots at the same time

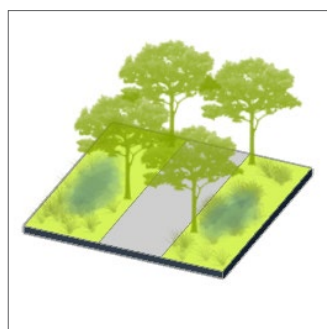
## COMMUNITY GARDEN

1 RESIDENTIAL LOT + 2 HOMESTEAD LOTS  
SITE: 3898 FRENCH RD

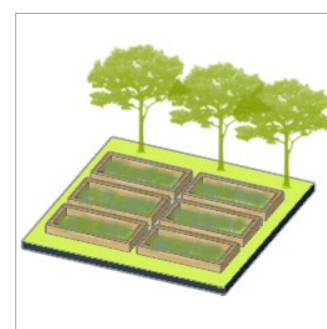
Designs Used:



POLLINATOR HABITAT



STORMWATER MANAGEMENT



URBAN AGRICULTURE



VEGETATIVE HEDGE

PRIVATE GARDEN

A small garden is a good place for people to take a rest, have outdoor activities and play with children. People can plant some flowers to create their dream garden.

RAISED PLANTING BED

Residents can plant flowers and plant vegetables and food.

RAIN GARDEN

Native plants work extra hard in your rain gardens.

PERMEABLE PAVERS

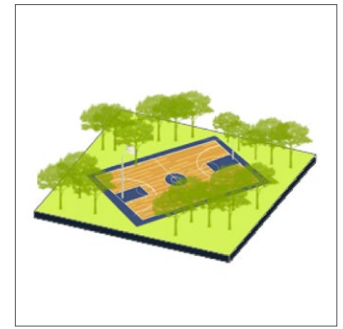
Permeable pavers are a great way to reduce concrete and flooding



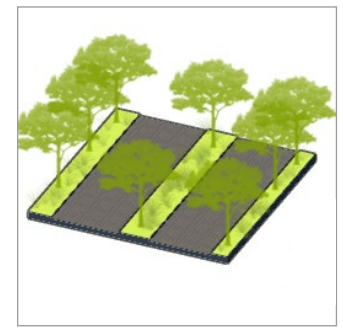
# SOCCER FIELD

1 RESIDENTIAL LOT + 4 HOMESTEAD LOTS  
SITE: 3898 FRENCH RD

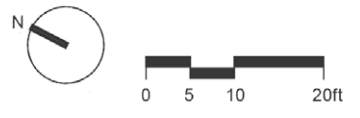
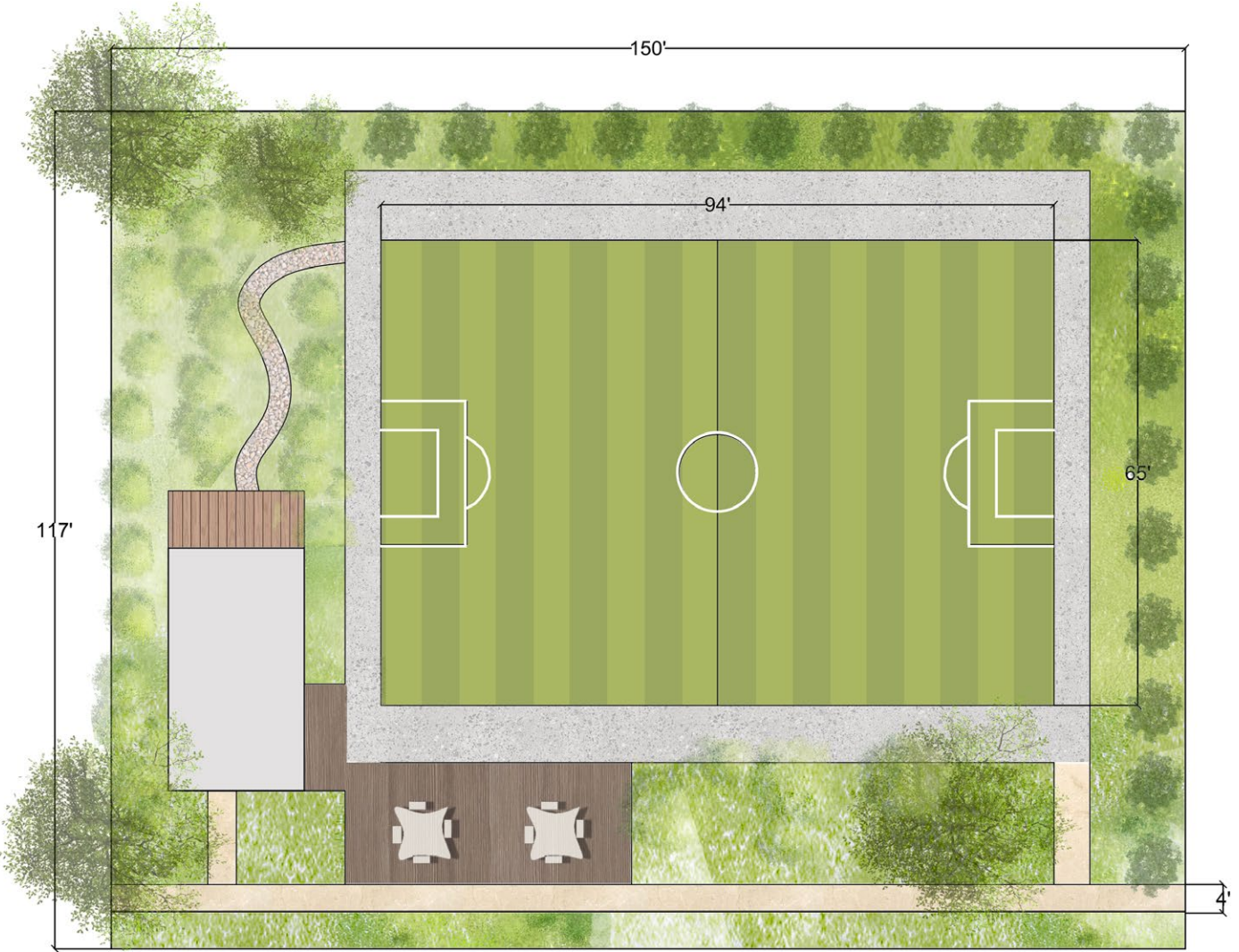
Designs  
Used:



ACTIVE RECREATION



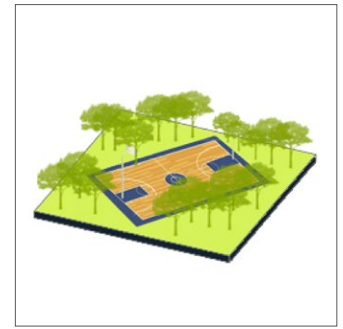
GREEN BUFFER



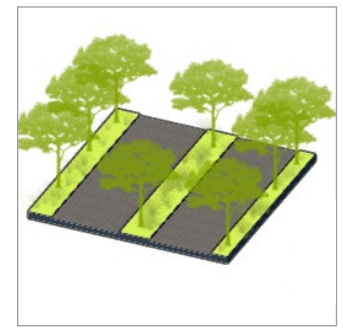
# BASKETBALL COURT

1 RESIDENTIAL LOT + 4 HOMESTEAD LOTS  
SITE: 3898 FRENCH RD

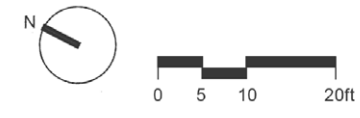
Designs  
Used:



ACTIVE RECREATION



GREEN BUFFER



# VISION

---



# Climate Impacts

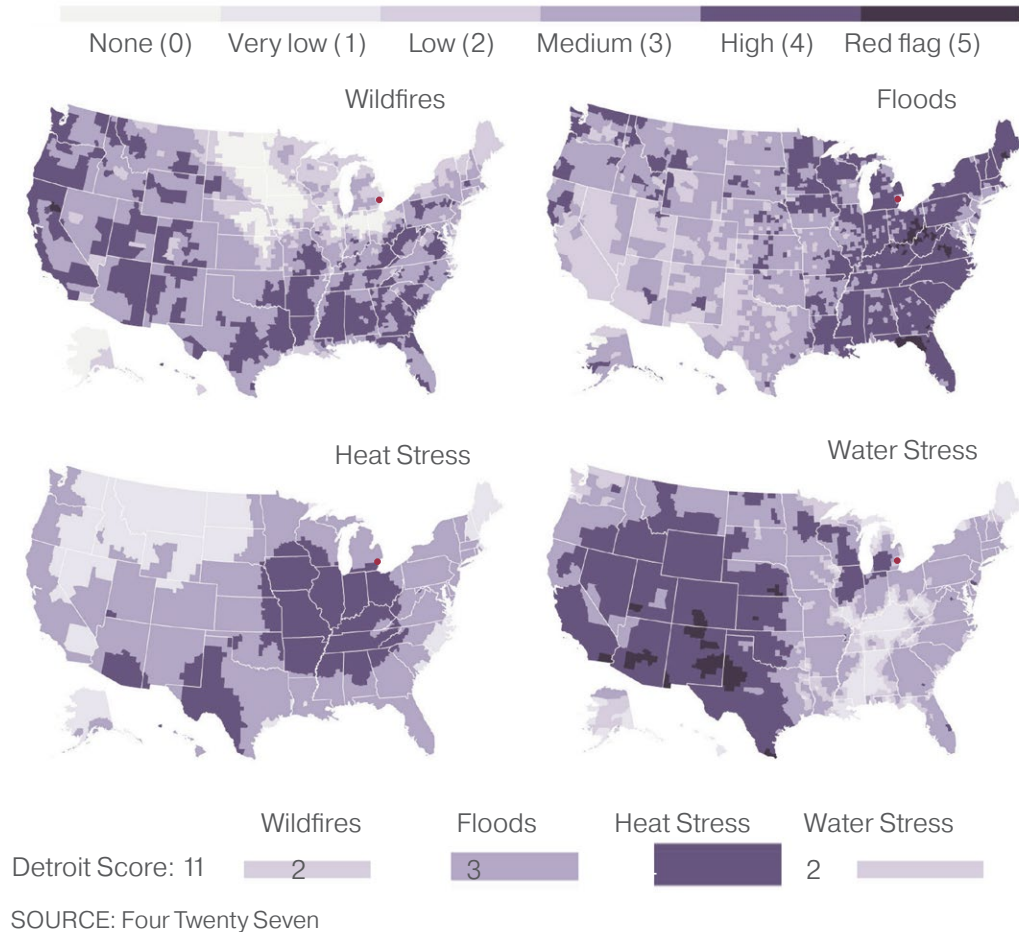
## CLIMATE CHANGE IN NORTH AMERICA

Climate change is characterized by long-term changes in temperature and weather patterns. These changes can be natural or man-made. But since the 19th century, climate change has been largely driven by human activity. (United Nations)

Rising temperatures are only the beginning of climate change. There are many other serious consequences of climate change, including droughts, water shortages, fires, rising sea levels, floods, melting polar ice, catastrophic storms and loss of biodiversity. (United Nations)

The map below shows a combination of climate risk data and projected population in 2040. The resulting score reflects the degree of exposure to climate risk in each part of the United States. (Four Twenty Seven)

It is worth noting that Detroit has higher scores in flooding and heat stress, which means that these two could be major climate hazards in the city's future. In fact, both problems are exposed now.



## CLIMATE CHANGE IN DETROIT

### Heat Stress

By mid-century (2041-2070), average annual temperatures in Detroit are projected to rise 4.1°F to 4.4°F compared with the 1971-2000 period. ("Projected Mid-Century Temperature Changes in the Midwest")

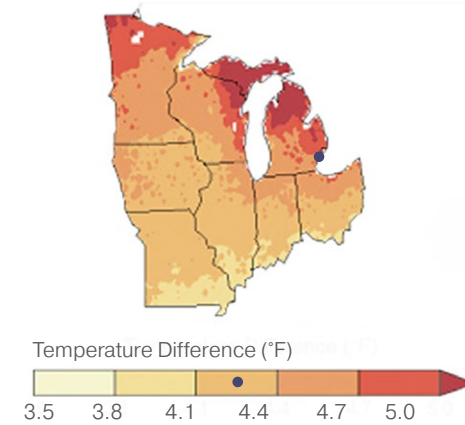
The Detroit metropolitan area, which averaged only 1.3 days above 95°F over the past 30 years, increased to 3 to 7 days over the next five to 25 years. By the middle of the century it will be 5-16 days. 15 to 67 days of extreme heat are likely by the end of the century. ("Heat in the Heartland: Climate Change and Economic Risk in the Midwest")

### Flood Risk

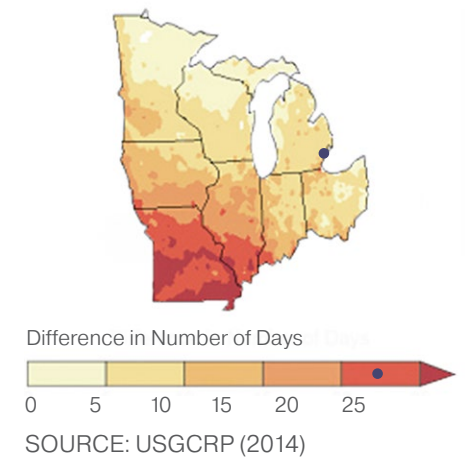
Flood Factor reports that "There are 22,959 properties in Detroit that have greater than a 26% chance of being severely affected by flooding over the next 30 years." This breaks down to about 6% of all properties in Detroit. ("Detroit, Michigan.")

Flooding can cause property damage, as well as cut off utility lines and access to emergency and transportation services. These consequences are known to affect the overall economic well-being of an area. ("Detroit, Michigan.")

### Rising Temperatures



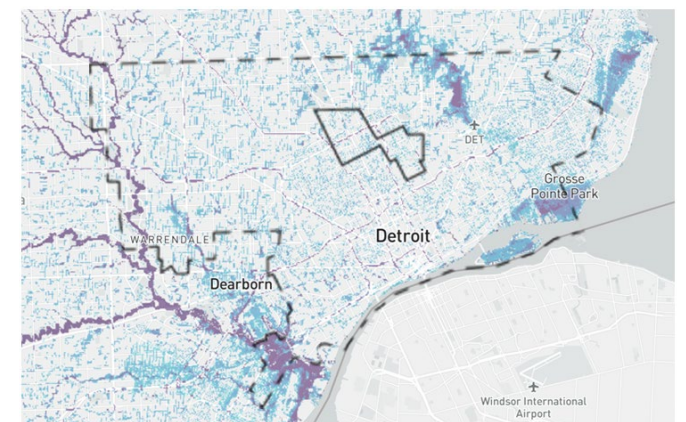
### Difference in Number of Extreme Hot Days (> 95°F)



### Flood Risk In 30 Years



Approximately 42.7k properties have a 0.2% chance of water reaching their buildings.



Aoorix. 5,824 properties have a 5% chance of water reaching their buildings.

SOURCE: FloodFactor

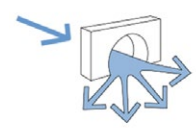
# Climate Adaptation

## FLOOD SOLUTIONS

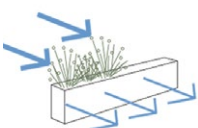
Stormwater management is an effort to reduce runoff from rain and melted snow into streets, lawns, and other surfaces, that would ultimately lead to larger bodies of water (“EPA Facility Stormwater Management”). In place of typically used gray infrastructure like culverts, gutters, and storm sewers, sustainable alternatives like blue/green infrastructure can be used to protect, restore, and mimic natural water cycles (Expert Environmental

Consulting). This is in addition to their ability to improve water quality through the removal of pollutants.

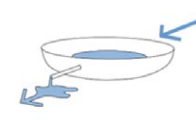
Some of the various blue/green stormwater infrastructure that are available to slow down flooding are shown in the graphic on the right. We have also noted the best management techniques for the Goodstock neighborhood in particular, these are highlighted in blue.



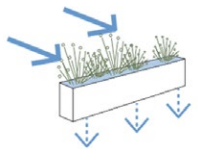
**Flow Control**  
A device used to control the flow of stormwater entering or leaving a stormwater treatment or retention system at a designed flow rate. The control of stormwater flow is necessary for any stormwater management system. (“Stormwater Flow Controls”)



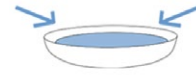
**Filtration**  
A filtration device is designed to slow the flow of rainwater and remove particles from the water through porous media such as sand and plant materials. (*Low Impact Development: A Design Manual for Urban Areas*)



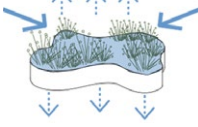
**Detention (Dry Pond)**  
Detention ponds are dry ponds that are used to temporarily hold stormwater, which is discharged slowly from the pond when water levels in local pipes decrease. (The Stormwater Blog)



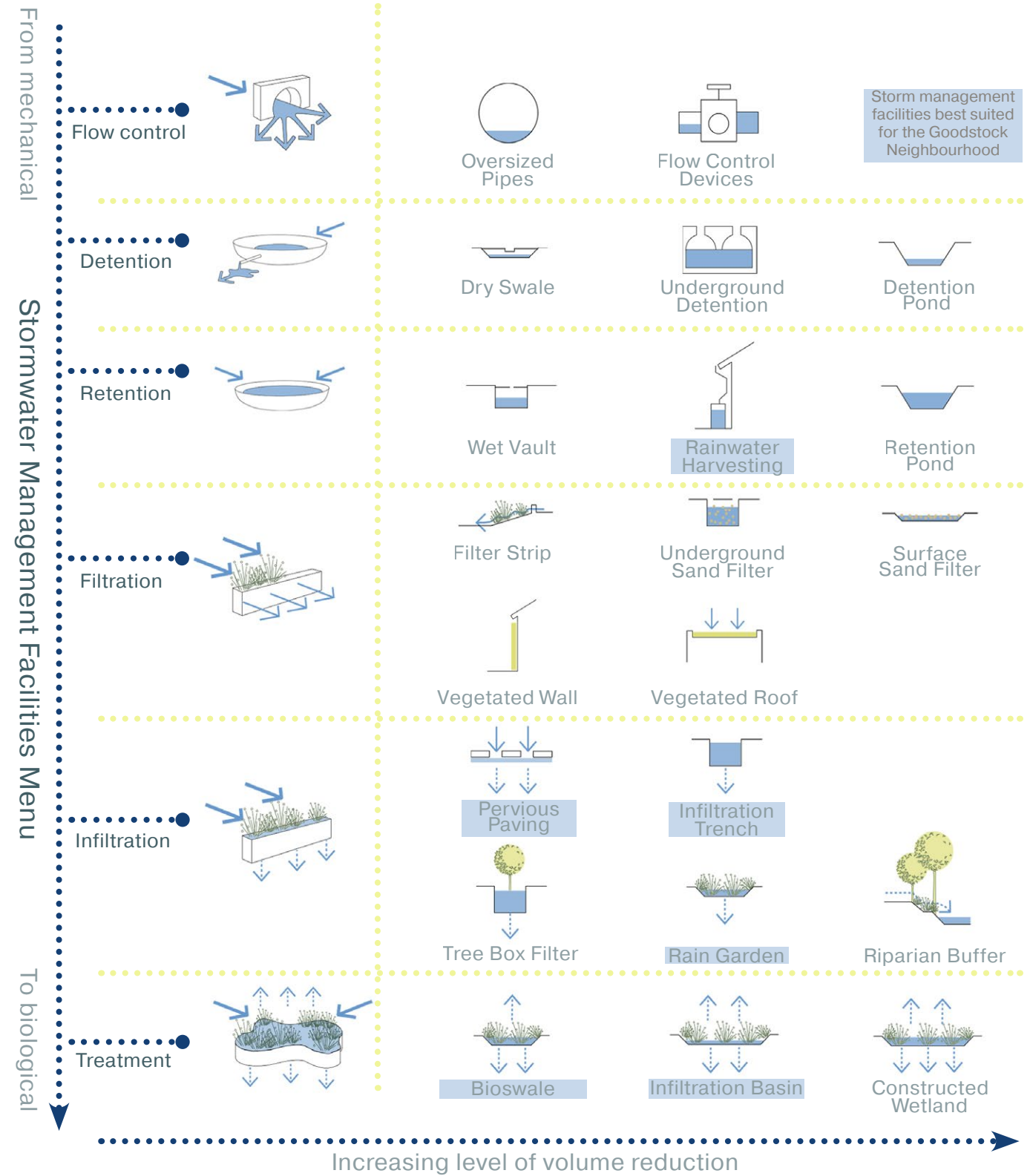
**Infiltration**  
Rainwater infiltration is the process by which rainwater flows into the soil and eventually replenishes streams, lakes, rivers and aquifers. (Weaver, 2014)



**Retention (Wet Pond)**  
Retention ponds are wet ponds that retain water on a permanent basis. The water level in the pond rises and falls depending on how much rain comes from the runoff area. (The Stormwater Blog)

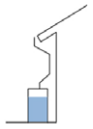


**Treatment**  
Stormwater treatment refers to the removal of pollutants using phytoremediation (plant based) or bacterial colonies. (*Low Impact Development: A Design Manual for Urban Areas*)



References: *Low Impact Development Manual for Michigan*  
*Low Impact Development: A Design Manual for Urban Areas*





# Rainwater Harvesting

Rainwater harvesting a structure designed to trap and store runoff from a roof. The systems allows for the reuse of rainwater, reducing water waste. The collected water is often used for irrigation or other needs. (SEMCOG, 2008)

**Benefits:**

- Domestic water supplement
- Wide range of applications
- Reduce waste of potable water
- Reduce costs and increase environmental value

**Limitations:**

- It can only cope with small storm event, requiring extra management and equipment to store stromwater (SEMCOG, 2008)

STORMWATER QUANTITY FUNCTIONS	
Volume	High
Groundwater Recharge	Low
Peak Rate	Low (depending on site design)
ADDITIONAL CONSIDERATIONS	
Cost	Medium
• Rain Barrel • Cistern	
Maintenance	Medium

**Rain barrel**

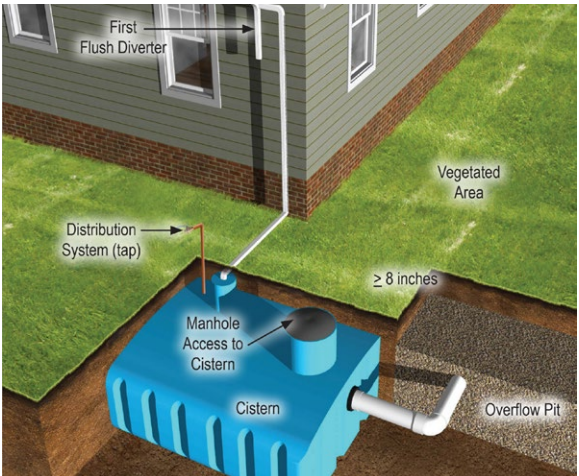
Rainwater barrels are connected to a roof drain pipe for direct storage of rainwater running off the roof. Rain barrels are common in individual homes where rainwater is reused for garden irrigation, including landscaped beds, trees, or other vegetated areas. (SEMCOG, 2008)



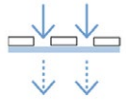
Rain barrel  
SOURCE: Brick + Beam Detroit

**Cisterns**

Cisterns have a greater storage capacity than rain barrels. Although cisterns can also be utilized for irrigation purposes, they are generally used to supplement sewage needs (such as flushing toilets or other sanitary sewer purposes). Cisterns can be made of fiberglass, concrete, plastic, brick or other materials and can be installed above or underground. Their storage capacity varies from 200 to 10,000 gallons. (SEMCOG, 2008)



Cistern Diagram  
SOURCE: Pg. 5-11, City of Dublin Stormwater Man-



# Pervious Paving

In contrast to normal paving that simply moves runoff directly into storm-drains, pervious paving is an infiltration technique that can be used to percolate runoff into the soil below. Pervious paving is suitable for parking lots, walkways, sidewalks, playgrounds, plazas, tennis courts and other similar uses. (SEMCOG, 2008)

**Benefits:**

- Water flow control and groundwater recharge, moderate flood control
- Dual use for pavement structure and stormwater management

**Limitations:**

- Pervious pavement not suitable for all uses
- High maintenance needs (SEMCOG, 2008)

**Porous asphalt**

Porous asphalt is standard asphalt that is reduced in fineness to allow water to pass through tiny voids. The appearance is similar to that of standard asphalt. (SEMCOG, 2008)

**Pervious concrete**

Pervious concrete, which has a coarser appearance than conventional concrete, creates drainage spaces by reducing the number of fine particles. In Detroit, the bottom of pervious concrete must have a stone base for storm water management and must never be placed directly on the soil base. More information about pervious concrete is available from the Michigan Concrete Association ([www.miconcrete.org/](http://www.miconcrete.org/)). (SEMCOG, 2008)

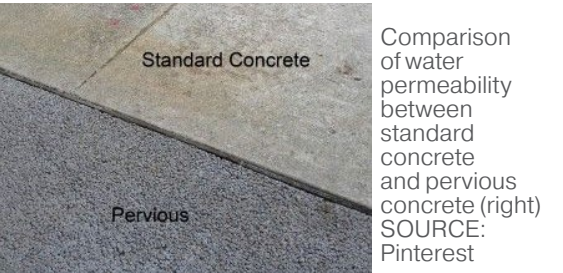
**Permeable paver blocks**

Permeable pavers consist of interlocking units. These units provide space to fill with permeable materials. With a tendency to be aesthetically pleasing, permeable paver blocks are particularly suitable for plazas, patios, parking lots, and low-speed streets. (SEMCOG, 2008)

STORMWATER QUANTITY FUNCTIONS	
Volume	High
Groundwater Recharge	High
Peak Rate	Med/High
ADDITIONAL CONSIDERATIONS	
Cost	Medium
Maintenance	High
Winter Performance	Medium



Comparison of water permeability between normal asphalt (left) and porous asphalt (right)  
SOURCE: civilogistix.com



Comparison of water permeability between standard concrete and pervious concrete (right)  
SOURCE: Pinterest



Permeable paver blocks  
SOURCE: Pine Hall Brick



## Infiltration Trench

An infiltration trench is a straight pipe with holes that sits within a stone-filled trench wrapped in geotextile fabric (permeable materials). An infiltration trench is typically part of a conveyance system and is intended to divert rainwater and reduce runoff by temporarily storing it. Over time, the stormwater will infiltrate into the natural soil around the infiltration trench and filter out particles as it passes through the medium. Infiltration trenches are particularly useful for poorly drained soils, but it is important to note that trees should not be planted near them. (SEMCOG, 2008)

- Benefits:**
- Reduces volume of stormwater runoff
  - Peak flow reduction
  - Increases groundwater recharge
  - Provides thermal benefits
- Limitations:**
- Pretreatment is required to prevent clogging
  - Not recommended for areas with steep slopes
- (SEMCOG, 2008)

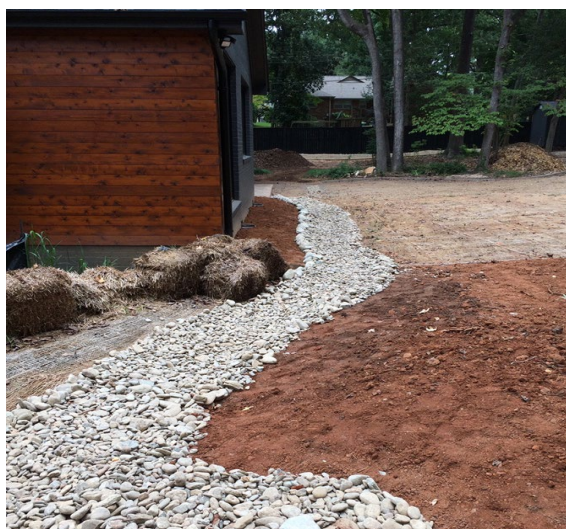
STORMWATER QUANTITY FUNCTIONS	
Volume	Medium
Groundwater Recharge	High
Peak Rate	Low/Med
INTEGRATION BMP	
MAX. DRAINAGE AREA	
Infiltration Trench	2 acres
CONSTRUCTION COSTS	
MAINTENANCE COSTS	

## Rain Garden

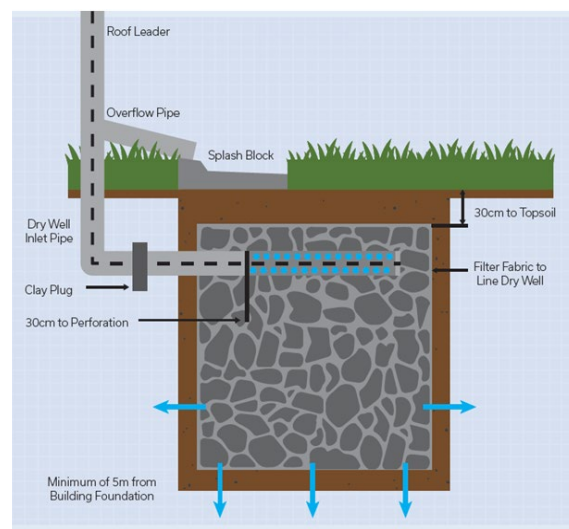
Rain gardens are shallow depressions planted with native plants that are specially chosen to collect and treat stormwater runoff. The image below depicts the technical structure of a rain garden, but each garden can be unique to its surroundings and requirements. Pond depth, soil mixture, infiltration beds, perforated under-drains, domed risers, and positive overflow structures can be designed to meet specific stormwater management requirements. (SEMCOG, 2008)

- Benefits:**
- Water flow control and groundwater recharge, moderate peak rate control, filtration
  - It is widely used and applicable
  - Enhance site aesthetics, habitat
  - Potential air quality and climate benefits
- Limitations:**
- Higher maintenance until vegetation is established
  - Requires careful selection and establishment of plants
- (SEMCOG, 2008)

STORMWATER QUANTITY FUNCTIONS	
Volume	Med/High
Groundwater Recharge	Med/High
Peak Rate	Medium
ADDITIONAL CONSIDERATIONS	
Cost	Medium
Maintenance	Medium
Winter Performance	Medium

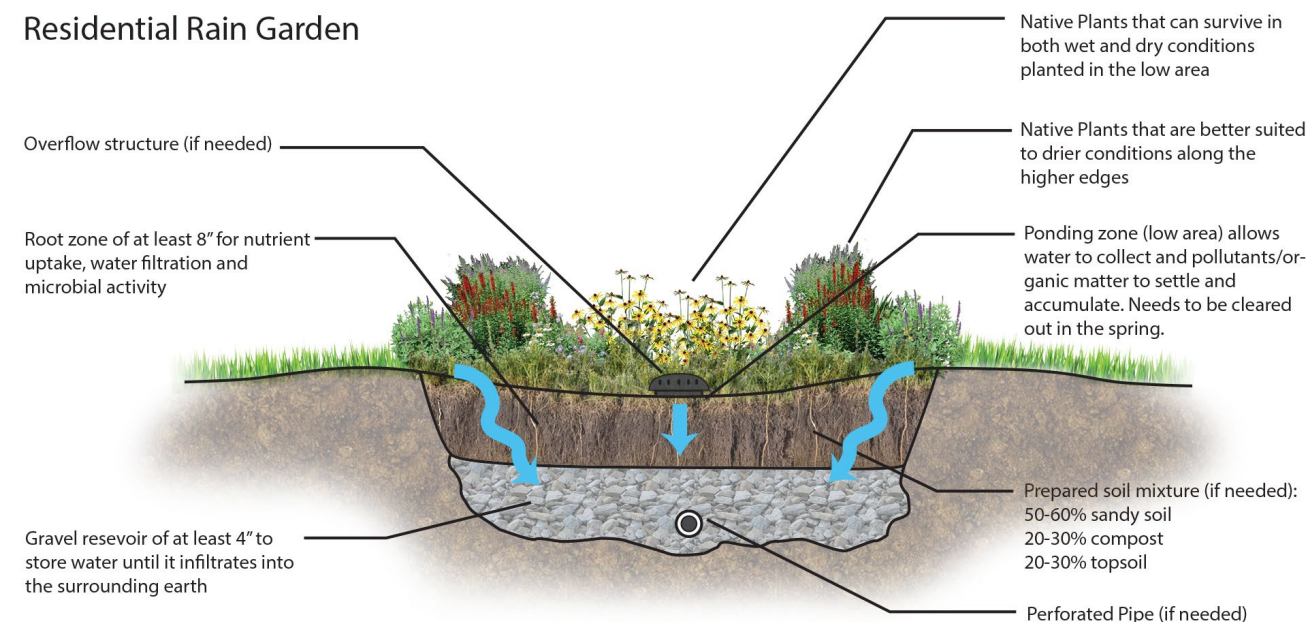


Residential infiltration trench  
SOURCE: The Whole Blooming Landscape

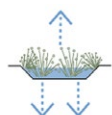


Schematic of a residential infiltration trench  
SOURCE: City Of Windsor

## Residential Rain Garden



Schematic of a small residential rain garden  
SOURCE: Holeman Landscape



## Bioswale

A bioswale is a shallow linear channel densely planted with a variety of grasses, shrubs, and/or trees designed to slow, filter, and infiltrate stormwater runoff. (SEMCOG, 2008)

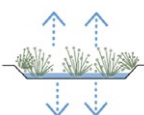
### Benefits:

- Can replace curb and gutter for site drainage to save costs
- Improve water quality
- Peak and volume control with infiltration

### Limitations:

- Limited application in spaces with limited area
- Unless designed for infiltration, peak and volume control are limited (SEMCOG, 2008)

STORMWATER QUANTITY FUNCTIONS	
Volume	Low/Med
Groundwater Recharge	Low/Med
Peak Rate	Low/Med
ADDITIONAL CONSIDERATIONS	
Cost	Low/Med
Maintenance	Low/Med
Winter Performance	Medium
CONSTRUCTION COST (PER LINEAR FOOT)	\$4.50 - \$8.50 (from seed) \$15 - \$20 (from sod)
ANNUAL O & M COST (PER LINEAR FOOT)	\$0.75
TOTAL ANNUAL COST (PER LINEAR FOOT)	\$1 from seed \$2 from sod
LIFETIME (YEARS)	50



## Infiltration Basin

Infiltration Basins are an open shallow area where existing soil and native vegetation temporarily store and permeate stormwater runoff. Sediment pretreatment is an important step in order to prevent clogging of the infiltration surface area (SEMCOG, 2008).

### Benefits:

- Reduces volume of stormwater runoff
- Reduces peak rate runoff
- Increases groundwater recharge

### Limitations:

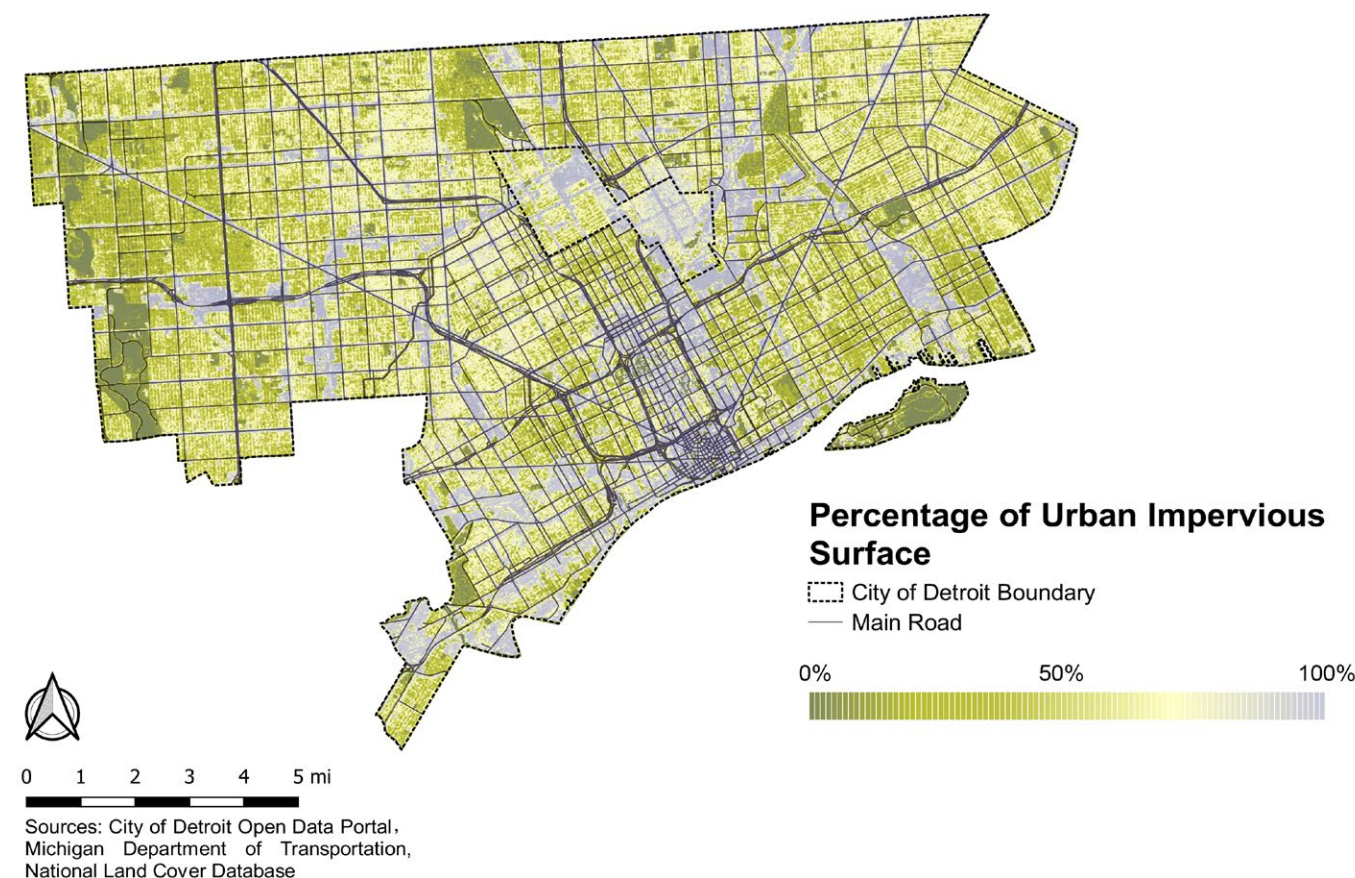
- Pretreatment is required to prevent clogging
- Not recommended for areas with steep slopes (SEMCOG, 2008)

STORMWATER QUANTITY FUNCTIONS	
Volume	High
Groundwater Recharge	High
Peak Rate	High
INFILTRATION BMP	MAX. DRAINAGE AREA
Infiltration Trench	10 acres
CONSTRUCTION COSTS	MAINTENANCE COSTS

## URBAN HEAT ISLAND MITIGATION

Urban heat islands (UHI) occur in urban areas that experience higher surface and air temperatures relative to surrounding suburbs and exurbs. Approximately 76.5% of Detroit's land is already developed, meaning large areas of impervious surface, such as concrete and asphalt. These materials absorb heat and radiate it into the air, causing the surface temperature to rise. These land-cover interactions cause urban areas to be hotter in the summer and thus more vulnerable

to extreme heat events. Additionally, there are many heat-related health effects that include asthma, allergies, chronic obstructive pulmonary disease, and deaths from heat waves. As Detroit is more vulnerable to rising temperatures than any other part of Michigan, this is particularly concerning. Therefore, it is important that Detroit communities take steps to reduce the urban heat island effect, especially in the context of global warming. (Gregg et al., 2012)



Percentage of Urban Impervious Surface



# Cool Pavements

Cool pavements are a strategy used to mitigate urban heat islands. The technical approach is to use reflective and permeable pavements because their surface temperatures are generally lower than those of traditional paving materials. The figure below compares the structure of conventional pavement (dense graded asphalt or concrete with low albedo) with two types of cool pavement: reflective (e.g. coated) and permeable (with permeable surface). (“Reducing Urban Heat Islands: Compendium of Strategies Cool Pavements”)

## Reflective pavements

Unlike traditional sidewalks, reflective pavements reduce ground and air temperatures by increasing the amount of reflected solar radiation, but the reflected heat may affect pedestrian comfort, building energy use and carbon emissions. (Wang et al., 2021)

### Benefits:

- Reduce urban energy consumption, especially during the hot season.
- Reflecting more light at night reduces the cost of street lighting and improves driving safety.
- Enhanced radiation from road surfaces can offset carbon emissions.

### Limitations:

- The reflectivity of road surfaces can change over time due to weathering and soil accumulation. The albedo of asphalt pavement increases with time, and that of concrete pavement increases with time.
- Increased thermal exposure of pedestrians during the day can cause discomfort and glare.

(Wang et al., 2021)

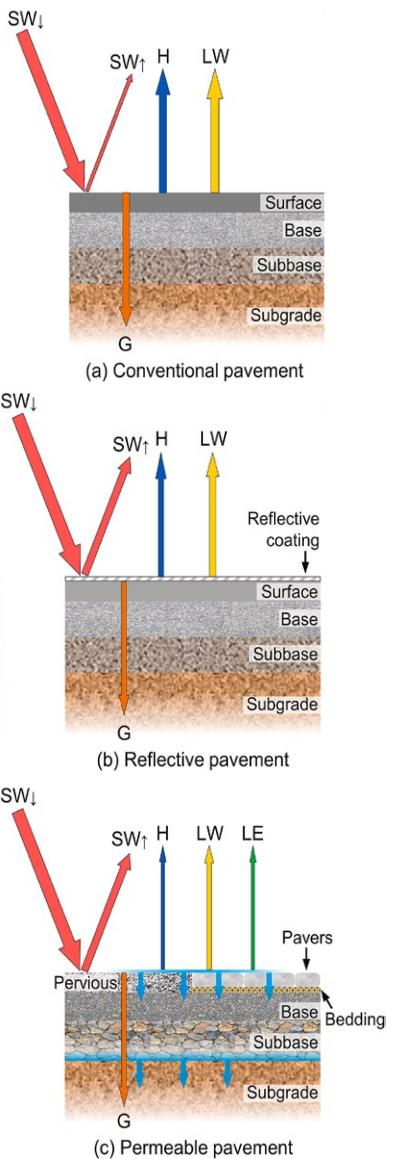
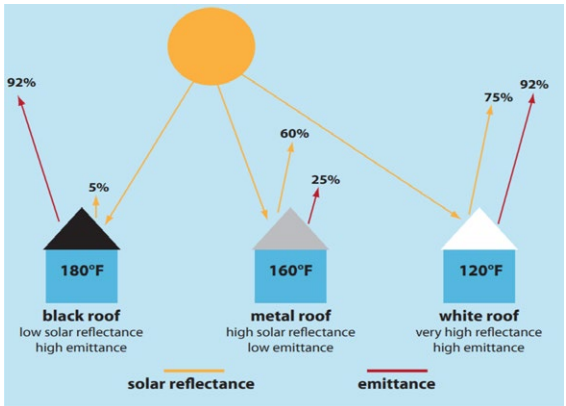


Figure. SW<sub>i</sub>, SW<sub>r</sub>, LW, G, H, and LE denote downward shortwave radiation (solar radiation), upward shortwave radiation (reflected), net longwave radiation, heat conduction, sensible heat flux, and latent heat flux, respectively. SOURCE: Cool pavements for urban heat island mitigation: A synthetic review

# Cool Roofs

Cool roofs can also help address heat island effects. Cool roofing products are made of highly reflective and emissive materials that can remain approximately 50 to 60°F (28-33°C) cooler than traditional materials during peak summer weather. Traditional roofs in the United States, in contrast, can reach summer peak temperatures of 150 to 185°F (66-85°C), thus creating a series of hot surfaces as well as warmer air temperatures nearby. (“Reducing Urban Heat Islands: Compendium of Strategies Cool Roofs”)

On hot, sunny summer days, a black roof reflects 5% of the sun’s energy and emits more than 90% of the heat it absorbs, with temperatures up to 180°F(82°C). A metal roof will reflect most of the sun’s energy while releasing about a quarter of its heat, with temperatures up to 160°F(71°C). A cool roof will reflect and release most of the solar energy and reach a peak temperature of 120°F(49°C). (“Reducing Urban Heat Islands: Compendium of Strategies Cool Roofs”)



Comparison of different types of roofs SOURCE: Reducing Urban Heat Islands: Compendium of Strategies - Cool Roofs

### Benefits:

- Cooler outside air.
- Better air quality.
- Slowed climate change.
- Energy and cost savings.
- Improved indoor comfort.

### Limitations:

- The demand for heating increases in winter.
- Glare is sometimes a problem on cool pavements.

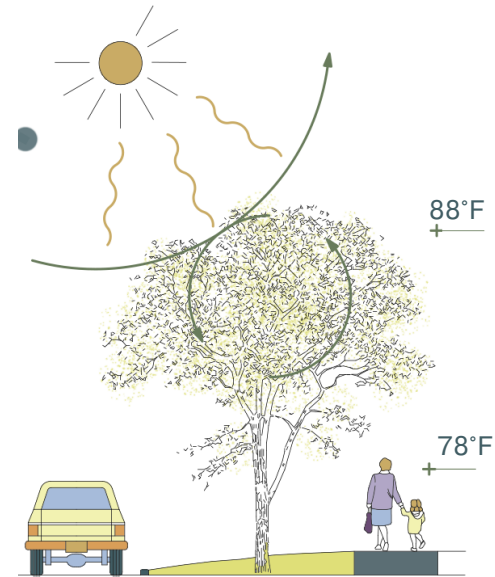
(“Reducing Urban Heat Islands: Compendium of Strategies Cool Roofs”)

## Increased Vegetation

Trees and herbaceous plants are an affordable and easy-to-implement urban heat island mitigation tool. In addition to creating shade, vegetation can also improve air quality by removing pollutants such as carbon monoxide and dust particles from the air. (“Reducing Urban Heat Islands: Compendium of Strategies Trees and Vegetation”)

### Shade trees

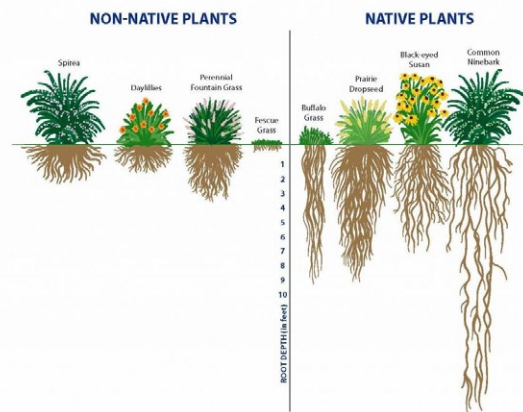
Leaves and branches can reduce the amount of solar radiation that reaches the ground, thereby lowering surface temperatures. These cooler surfaces, in turn, reduce heat transfer to buildings and the atmosphere. Trees can also act as windbreaks or windshields in order to reduce wind speeds near buildings. Especially in winter, lowering the wind speed of the cold north wind can reduce heating consumption of buildings. (“Reducing Urban Heat Islands: Compendium of Strategies Trees and Vegetation”)



Shading can reduce the temperature below the tree canopy by about 10 °F (6 °C)  
SOURCE: Author

### Native plants

In the United States, native plants are defined as those found naturally in a particular area before European colonization. Native plants provide habitat and essential food sources for birds and are the foundation of an area’s biodiversity. Native plants usually require minimal maintenance because they are adapted to local precipitation and soil conditions, thus being environmentally beneficial and saving money. In addition, the roots of native plants help the infiltration of rainwater. (“Native Plants”)



Due to the strong roots of native plants, landscaping with native plants is a great way to reduce the amount of nutrients and runoff that leaves your property.  
SOURCE: <https://toledolakeerie.clearchoices-cleanwater.org/>

### Resources

- Michigan Flora (University of Michigan Herbarium): <https://michiganflora.net/>
- Lady Bird Johnson Wildflower Center: <https://www.wildflower.org/plants/>
- Michigan Natural Features Inventory: <https://plants.usda.gov/home>
- Native Plants Database - National Audubon Society: <https://www.audubon.org/native-plants>

## List of recommended trees for the city of Detroit

This recommended tree list contains major urban tolerance trees on both public and private properties, including some native species. (“List of Recommended Trees for The City of Detroit”)

COMMON NAME	LATIN NAME	FLOOD TOLERANCE	DROUGHT TOLERANCE
Red Oak	Quercus rubra	High	Low
Ohio Buckeye	Aesculus glabra	Extended	Moderate
Ginkgo (male)	Ginkgo biloba	Occasional	High
American Horn-beam	Carpinus caroliniana	Occasional	Moderate
Bald Cypress	Taxodium distichum	Extended	High
Black Gum	Nyssa sylvatica	Extended	Moderate
Canada Service-berry	Amelanchier canadensis	Occasional	Moderate
White Pine	Pinus strobus		Low

Visit <https://www.greeningofdetroit.com/caring-for-trees> for a list of recommended trees in Detroit and more information on buying new trees.

## List of prohibited trees for the city of Detroit

Trees may also have disadvantages. Pollen from some male trees can cause allergies and breathing problems. Other trees emit volatile organic compounds (VOCs), which can reduce air quality. There are also uncertain safety issues such as spreading roots, falling fruit and seeds, broken and low-hanging branches. These issues need to be considered when placing trees. (Staff, 2021)

COMMON NAME	LATIN NAME	NOTES
Ash (all varieties, unless EAB resistant )	Fraxinus spp.	Fatally prone to pests, Emerald Ash Borer (EAB) problem
American Elm (native)	Ulmus americana	Fatally prone to Dutch Elm disease
Black locust	Robinia pseudoacacia	Aggressive spreader, cultivars can revert back to thorned native
Ginkgo (female)	Ginkgo biloba	Messy, smelly fruit
Honey locust (thorned)	Gleditsia tricanthos	Overplanted. Messy fruit, prone to disease and numerous, painful thorns.

Visit <https://www.greeningofdetroit.com/caring-for-trees> for a list of prohibited trees in Detroit and more information on buying new trees.



# Case Studies

Case Studies are a great way of curating different research methods under a similar context. This allows us to inform design decisions with broader perspectives as well as provide a greater understanding to new design theories. Thus in this section we selected several case studies to show you some of the different and innovative design approaches that have been applied to other communities who have also been combating similar issues such as vacant

land, climate change, community engagement as well as amelioration. With each case study, we hope it helps inform wise practices by listing out their goals and project development concepts as well as challenges and solutions.

Additionally, a case study matrix was created with a variety of case studies to compare and display some of the specific methods adopted by using the typologies matching with our own designs.



SOURCE: [climate.asla.org/FitzgeraldRevitalizationPlan.html](http://climate.asla.org/FitzgeraldRevitalizationPlan.html)

## PROJECT

### Fitzgerald Revitalization Project

Year: 2017  
Location: Detroit, MI  
Budget: \$15 Million

### Re-imagining a More Sustainable Cleveland

Year: 2008  
Location: Cleveland  
Budget: \$1 Million

### PUSH project in Buffalo (the green development zone)

Year: 2017  
Location: Buffalo, NY

### Neighborhood Detox: Enhancing Resilience in a Hazard Vulnerable Area

Year: 2016 (Competition Project)  
Location: Houston, TX

### Sifting the Landscape: Transforming Vacant Lands through Smart Decline

Year: 2016 (Competition Project)  
Location: Dayton, OH

## TOP PERFORMANCE GOALS

 PARK	 POLLINATOR HABITAT	 STORMWATER MANAGEMENT
 FARMERS MARKET	 URBAN AGRICULTURE	 PARK
 PARK	 STORMWATER MANAGEMENT	 PUBLIC ART
 POLLINATOR HABITAT	 URBAN AGRICULTURE	 PUBLIC ART
 FARMERS MARKET	 STORMWATER MANAGEMENT	 PLAYGROUND



# FITZGERALD REVITALIZATION PROJECT

**Location: Detroit, Michigan**  
**Company: Spackman Mossop Michaels**

“The Fitzgerald Revitalization Plan envisions a new way to help distressed neighborhoods: focus on the landscape of the entire neighborhood rather than blighted properties on a lot-by-lot basis. The project considers all vacant and blighted properties in the entire one-quarter-square-mile neighborhood, envisioning an entirely blight-free community. Healthy landscapes became the framework

that holds together all the other initiatives in the neighborhood—affordable housing, crime reduction, improved health outcomes, and workforce development, among others. The vision of a healthy, walkable, vibrant neighborhood with access to parks, greenways, and community spaces is the idea around which the other initiatives revolve.”

- [climate.asla.org/FitzgeraldRevitalizationPlan.html](http://climate.asla.org/FitzgeraldRevitalizationPlan.html)



SOURCE: [climate.asla.org/FitzgeraldRevitalizationPlan.html](http://climate.asla.org/FitzgeraldRevitalizationPlan.html)

### Goals:

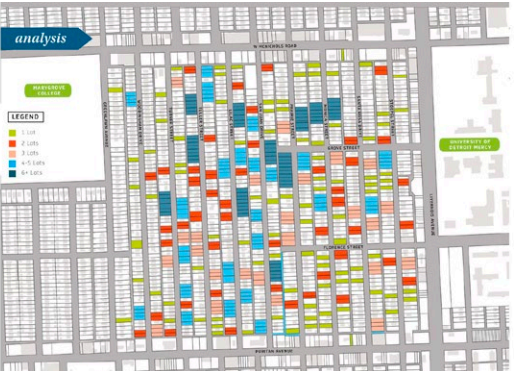
The project aims to create landscapes as the Framework for Community Reinvestment. This includes a healthy, walkable, vibrant neighborhood with access to parks, greenways, and community spaces.

### Challenges:

- Vacant, overgrown lots
- Empty houses, some in good shape, some in grave disrepair
- Bad street layout, lack of pedestrian routes, and the high speed of traffic

### Project Development:

1. Count and analyze all vacant houses in a neighborhood
2. Classify by adjacency, size, distribution and ownership
3. Decide important spatial nodes
4. Highlight large living areas
5. Decide location of central park and 5-10 min walk boundary
6. Decide two greenways



SOURCE: [asla.org/2017awards/327798.html](http://asla.org/2017awards/327798.html)

## PROJECT COMPONENTS

### Ella Fitzgerald Park

Central park connection with greenway and serve as a community gathering space.

### Fitzgerald Greenway

Connect two sides and create new pedestrian and bicycle routes. Plant new canopy trees.

### Productive Landscape Initiative

Market-driven landscape based business, such as local food production, hops production for local breweries, or cut flowers.

### Landscape Stewardship Plan

Implement a series of landscape typologies including orchards, pollinator meadows, community gathering spaces, and community gardens.



# PUSH PROJECT IN BUFFALO (THE GREEN DEVELOPMENT ZONE)

**Location: Cleveland, OH**

**Company: PUSH Buffalo, The Wash Project, Ujima Theater**

“Ten years ago, PUSH Buffalo, an upstate affordable housing developer and internationally-recognized leader in the field of sustainable community development, established the Green Development Zone (GDZ) – a 25-square block area on Buffalo’s West Side, home to a concentration of affordable housing, workforce training

programs, green infrastructure, and community facilities. For the past three years, HST has been working with PUSH to increase local resident involvement in the ongoing design and development of the GDZ with neighborhood planning support, community mapping, way-finding, and interactive engagement tools.”

- [hesterstreet.org/projects/push-buffalo-the-green-development-zone-and-school-77](https://hesterstreet.org/projects/push-buffalo-the-green-development-zone-and-school-77)



SOURCE: [www.pushbuffalo.org/wp-content/uploads/2019/06/PPG-PUSH-GDZ-Report.6.2017.pdf](https://www.pushbuffalo.org/wp-content/uploads/2019/06/PPG-PUSH-GDZ-Report.6.2017.pdf)

### Goals:

The goal of the project was to create a framework for community reinvestment. This was in addition to a healthy, walkable, vibrant neighborhood with access to parks, greenways, and community spaces.

### Challenges:

- Stakeholder engagement and employment challenges
- Keeping the price of the services affordable
- Maintaining collaborations with local unions

### Methods:

1. Community Engagement
2. Green and Affordable Housing
3. Greening Vacant Lots
4. Creation of Community Public Space
5. Art and Culture



SOURCE: <https://www.pushbuffalo.org/wp-content/uploads/2019/06/PPG-PUSH-GDZ-Report.6.2017.pdf>

## PROJECT COMPONENTS

### Leadership Training

Developing leadership within the community is beneficial to PUSH because community leaders can share work and encourage community participation.

### Community Engagement

Door-knocking Meetings  
Text Message  
Social Media Campaigns

### Initiatives within the Green Development Zone

Establish methods to create green and affordable housing, take over vacant lots to better serve the community, making gathering places, assisting arts and culture organizations and projects, etc.



# Resources

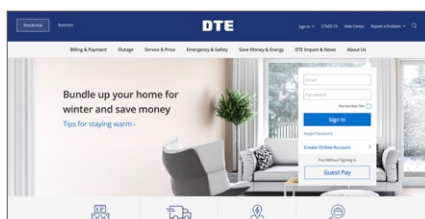


## CLIMATE RESOURCES



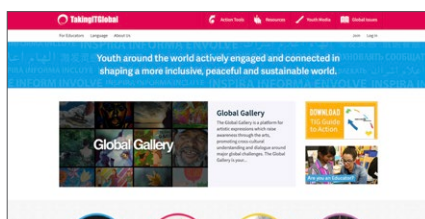
### Greening of Detroit

Greening of Detroit's mission is to guide and inspire others to create a 'greener' Detroit through planting and educational programs environmental leadership, advocacy, and by building community capacity.  
[www.greeningofdetroit.com](http://www.greeningofdetroit.com)



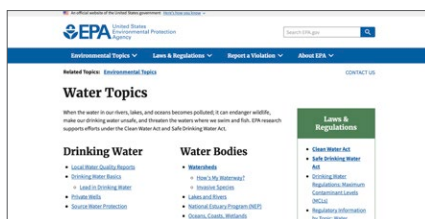
### DTE Energy

The DTE Energy website offers many resources and tips for reducing energy in residences along with information on rebates for energy saving appliances.  
[www.DTEEnergy.com](http://www.DTEEnergy.com)



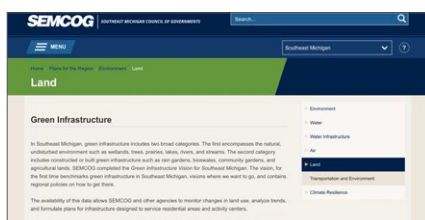
### Climate Change Youth Guide to Action

A resource guide for youth to take action in climate change.  
[www.climate.takingitglobal.org](http://www.climate.takingitglobal.org)



### EPA: Green Infrastructure

Here you can learn about local drinking water reports and watershed information for your area.  
<https://www.epa.gov/environmental-topics/water-topics>



### SEMCOG: Low Impact Development Manual for Michigan

This manual demonstrates different green infrastructure opportunities for Michigan.  
<http://www.semco.org/lowimpactdevelopment.aspx>



## FUNDING RESOURCES



### Community Development Block Grants (CDBGs)

The program supports community development activities to build stronger and more resilient communities.  
<https://www.hudexchange.info/programs/cdbg/>



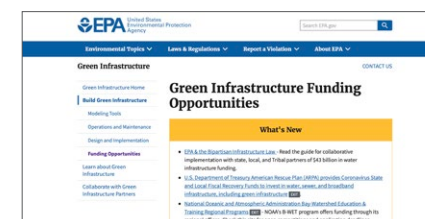
### Michigan Community Resilience Program

The program assists with strengthening the infrastructure and capacity of nonprofits to respond to rural and urban needs.  
[https://www.michigan.gov/leo/0,5863,7-336-94421\\_95498\\_6158-547244--,00.html](https://www.michigan.gov/leo/0,5863,7-336-94421_95498_6158-547244--,00.html)



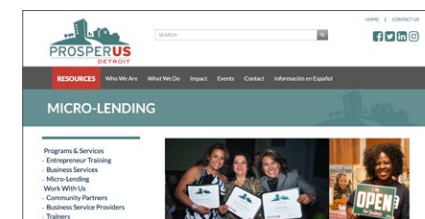
### The Americana Foundation

The foundation supports locally grown food, sustainable and fair food systems in addition to community-based agriculture.  
[http://www.americanafoundation.org/agri\\_grants.asp](http://www.americanafoundation.org/agri_grants.asp)



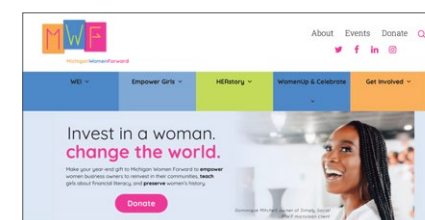
### Green Infrastructure Funding Opportunities

The EPA website has many resources for stormwater projects, including assistance programs, publications, and financing tools.  
<https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities>



### Prosperus Detroit Mico-Lending

The program provides access to capital for start-up and existing small businesses in targeted neighborhoods across Detroit. They also provide a wealth of funding knowledge on their website.  
[www.prosperusdetroit.org/micro-lending/](http://www.prosperusdetroit.org/micro-lending/)



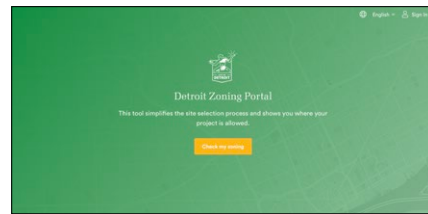
### Michigan Women Forward

With more than 30 years of high impact work, Michigan Women's Foundation is devoted to fostering economic empowerment for Michigan's women and girls through philanthropy and investment.  
[miwf.org](http://miwf.org)





## DEVELOPMENT RESOURCES



### Detroit Zoning Portal

This tool simplifies the site selection process and shows you where your project is allowed.

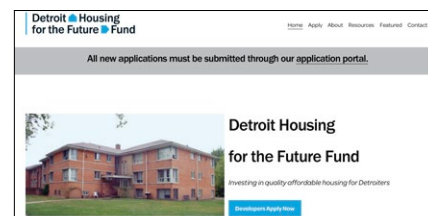
<https://zoning.detroitmi.gov>



### Development Opportunities Map

The interactive map allows you to search for property information across Detroit.

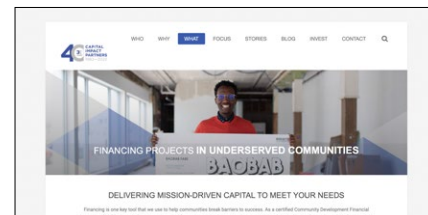
<https://detroitmi.gov/webapp/detroit-development-opportunities>



### Detroit Housing for the Future Fund

The fund was put in place to invest in quality affordable housing for Detroit residents.

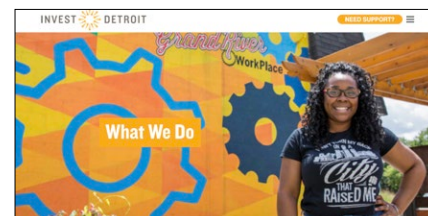
<https://www.detroithousingforthefuturefund.org>



### Capital Impact Partners

Capital Impact Partners is dedicated to delivering both the capital and commitment that help build strong, vibrant communities of opportunity.

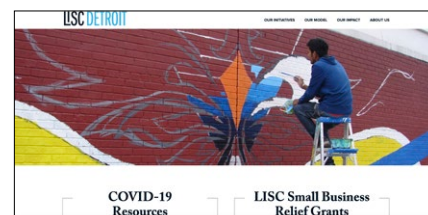
<https://www.capitalimpact.org/what/mission-driven-financing/>



### Invest Detroit

Invest Detroit was created to bring partnerships and philanthropic resources together to support real estate and business projects that struggle to find traditional financing.

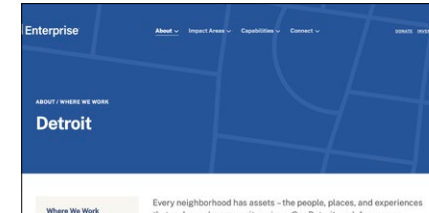
<https://investdetroit.com/what-we-do/#realestate>



### LISC Detroit

LISC Detroit serves the city through various grants, loans, and programs investments.

<https://www.lisc.org/detroit/>



### Enterprise

Our Detroit work focuses on leveraging those assets with capital, programs and policy to advance racial equity and preserve affordable homes.

<https://www.enterprisecommunity.org/about/where-we-work/detroit>



## POLICY RESOURCES



### DLBA Vacant Land Policy

Greening of Detroit's mission is to guide and inspire others to create a 'greener' Detroit through planting and educational programs environmental leadership, advocacy, and by building

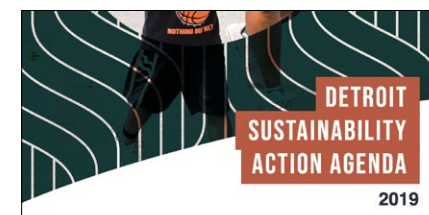
<https://detroitmi.gov/sites/detroitmi.localhost/files/2020-07/DLBA%20-%20Vacant%20Land%20Policy%20202003.pdf>



### Detroit Climate Action Plan

This plan proposes specific ideas and goals with benchmarks for the city to serve as a stimulus for generating public and political support for climate action.

[https://detroitenvironmentaljustice.org/wp-content/uploads/2017/11/CAP\\_WEB.pdf](https://detroitenvironmentaljustice.org/wp-content/uploads/2017/11/CAP_WEB.pdf)



### Detroit Sustainability Action Agenda

The agenda outlines a strategic road map to create a more sustainable city where all Detroit residents thrive and prosper.

<https://detroitmi.gov/sites/detroitmi.localhost/files/2019-06/Detroit-Sustainability-Action-Agenda-Web.pdf>



### Detroit Policy Conference

The conference is a great resource of information for stakeholders looking to lead a sustainable future for Detroit.

<https://www.detroitchamber.com/dpc/>



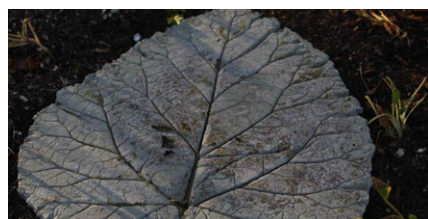
### DIY RESOURCES



#### DIY Raised Garden Beds

Step-by-step instructions on how to construct raised garden beds for your own backyard.

<https://queenbeetoday.com/how-to-build-raised-garden-beds/>



#### DIY Concrete Stepping

This tutorial shows you how to make beautiful concrete stepping stones with leaves from your garden! This is a fun and easy way to add structure and creativity to your garden design.

[Farmhouseandblooms.com/how-to-make-concrete-stepping-stones-with-leaves](http://Farmhouseandblooms.com/how-to-make-concrete-stepping-stones-with-leaves)



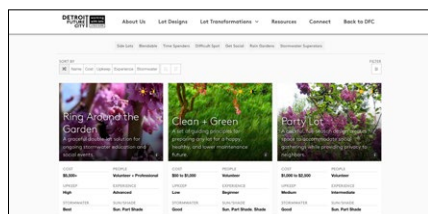
#### Keep Growing Detroit

The Urban Gardening Guides are a series of short and easy-to-follow instructional guides designed by the staff to share best practices honed over decades of experience in the field.

[detroitagriculture.net/garden-resource-program-2/garden-guides-curriculum/](http://detroitagriculture.net/garden-resource-program-2/garden-guides-curriculum/)



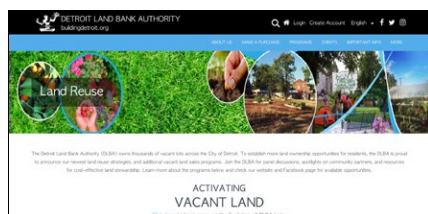
### LAND USE RESOURCES



#### Detroit Future City Working With Lots

The Detroit Future City (DFC) Field Guide to Working with Lots is a tool to better connect Detroit residents to resources in order to learn, collaborate, and better practice land stewardship in Detroit.

<https://detroitfuturecity.com/whatwedo/land-use/DFC-lots/lot-designs/>



#### DLBA Land Reuse Program

To establish more land ownership opportunities for residents, the DLBA is proud to announce our newest land reuse strategies, and additional vacant land sales programs

<https://buildingdetroit.org/land-reuse-programs>



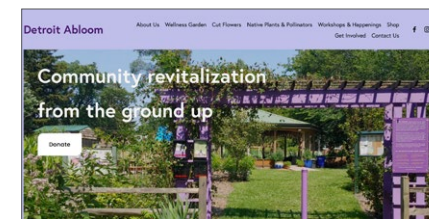
### OTHER RESOURCES



#### MSU Soil Test

The tool offers a home soil test service and personalized fertilizer recommendations to grow healthy beautiful garden while protecting the environment

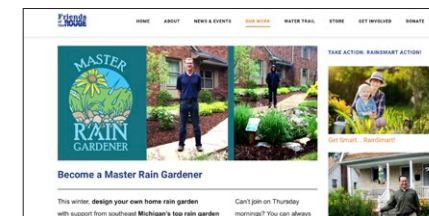
[homesoiltest.msu.edu/get-started](http://homesoiltest.msu.edu/get-started)



#### Detroit Abloom

Detroit Abloom is a model land-use demonstration project, based on using cut flower farming and the creation of native plant sanctuary gardens to re-purpose vacant blighted land.

[www.detroitabloom.com](http://www.detroitabloom.com)



#### Become a Master Rain Gardener

This program, run by the Friends of the Rouge, teaches you how to design and create your own rain gardens.

[therouge.org/master-rain-gardener/](http://therouge.org/master-rain-gardener/)



# Appendix

## APPENDIX A: PRELIMINARY COST ESTIMATES/TAKEOFFS

### PRODUCTIVE SIDE YARD



### Preliminary Cost Estimate

Material costs: \$2.66/sf

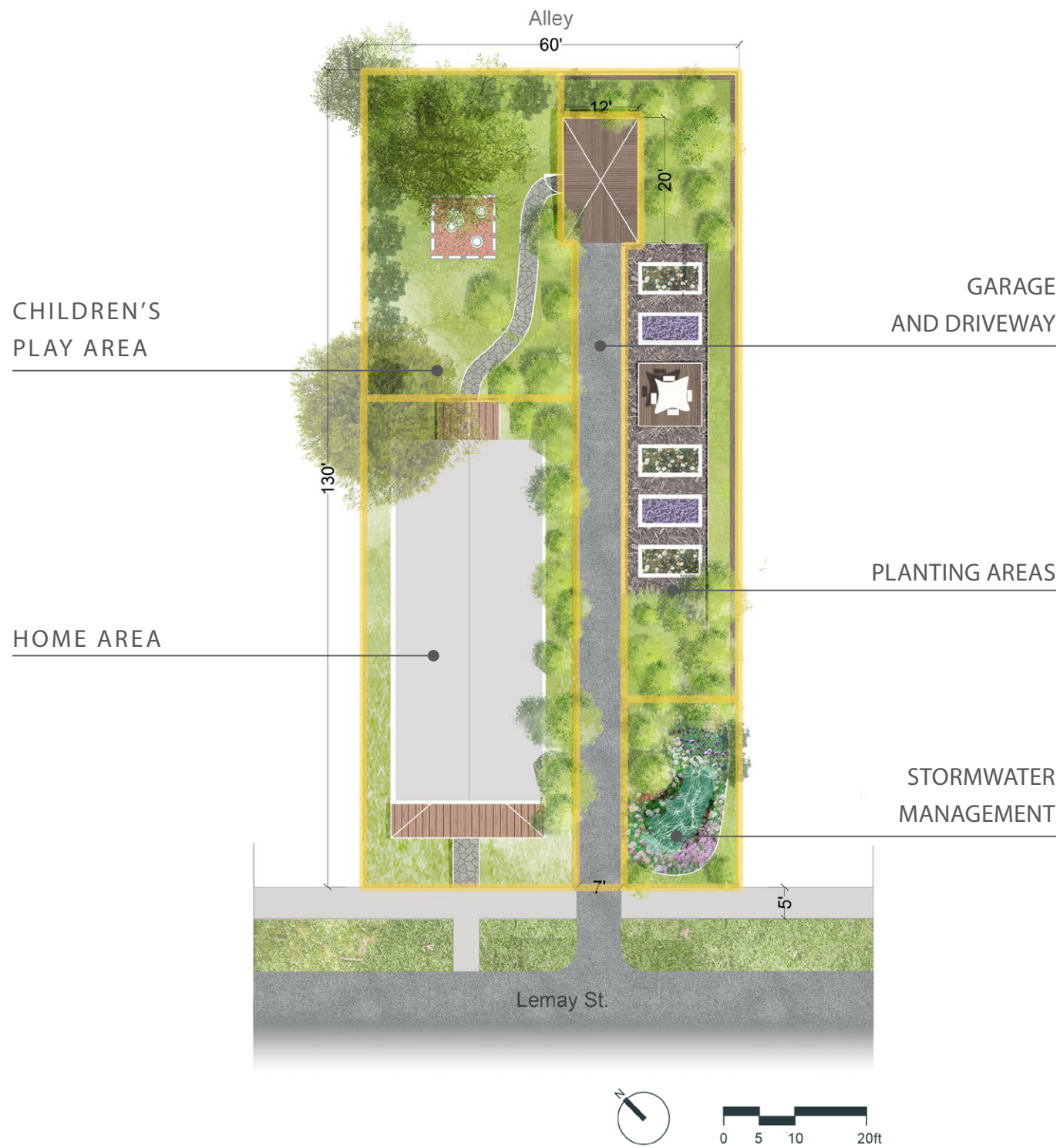
DESCRIPTION	MATERIAL COST
<b>Home Area</b>	
Wood Deck	Subtotal Home Area: \$4,607
Sodded Lawn	
<b>Community Meeting Space</b>	
Pavers, including base materials	Subtotal Community Meeting Space: \$6,967
Pea Gravel, 3" depth	
Wood Deck	
Wooden Picnic Table	
<b>Planting Area</b>	
Pavers, including base materials	Subtotal Planting Area: \$9,240
Raised Planting Beds	
Planting Soil	
Greenhouse	
Shrub (#5)	
<b>Park</b>	
Sodded Lawn	Subtotal Park: \$5,149
Pavers, including base materials	
Pavilion	
<b>Stormwater Management</b>	
Plants	Subtotal Stormwater Management: \$2,184
Sodded Lawn	
<b>Total: \$28,147</b>	

### Preliminary Takeoff (10,584sf): Home Lot + Two Lots

DESCRIPTION	SQUARE FOOTAGE
Home Area	3,528
Community Meeting Space	1,330
Planting Areas	2,157
Park	2,693
Stormwater Management	876
<b>Total</b>	<b>10,584</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.

### ACCESSORY STRUCTURE LOT - SINGLE



### Preliminary Cost Estimate

Material costs: \$3.26/sf

DESCRIPTION	MATERIAL COST
<b>Home Area</b>	
<a href="#">Pavers, including base materials</a>	Subtotal Home Area: \$1,562
<a href="#">Native Plant Plugs</a>	
<b>Garage and Driveway</b>	
<a href="#">Single Car Garage</a>	Subtotal Garage and Driveway: \$11,244
<a href="#">Garage Foundation</a>	
<a href="#">Asphalt Driveway</a>	
<b>Planting Area</b>	
<a href="#">Pea Gravel, 3" depth</a>	Subtotal Planting Area: \$6,182
<a href="#">Wooden Picnic Table</a>	
<a href="#">Raised Planting Beds</a>	
<a href="#">Planting Soil</a>	
<a href="#">Native Plant Plugs</a>	
<a href="#">36" Split Rail Fence</a>	
<a href="#">Evergreen Hedge</a>	
<b>Children's Play Area</b>	
<a href="#">Pavers, including base materials</a>	Subtotal Children's Play Area : \$2,918
<a href="#">Native Plant Plugs</a>	
<a href="#">Rubber Mulch, 3" depth</a>	
<a href="#">Evergreen Hedge</a>	
<b>Stormwater Management</b>	
<a href="#">Native Plant Plugs</a>	Subtotal Stormwater Management : \$3,542
<a href="#">Rain Garden Plants</a>	
<b>Total: \$25,448</b>	

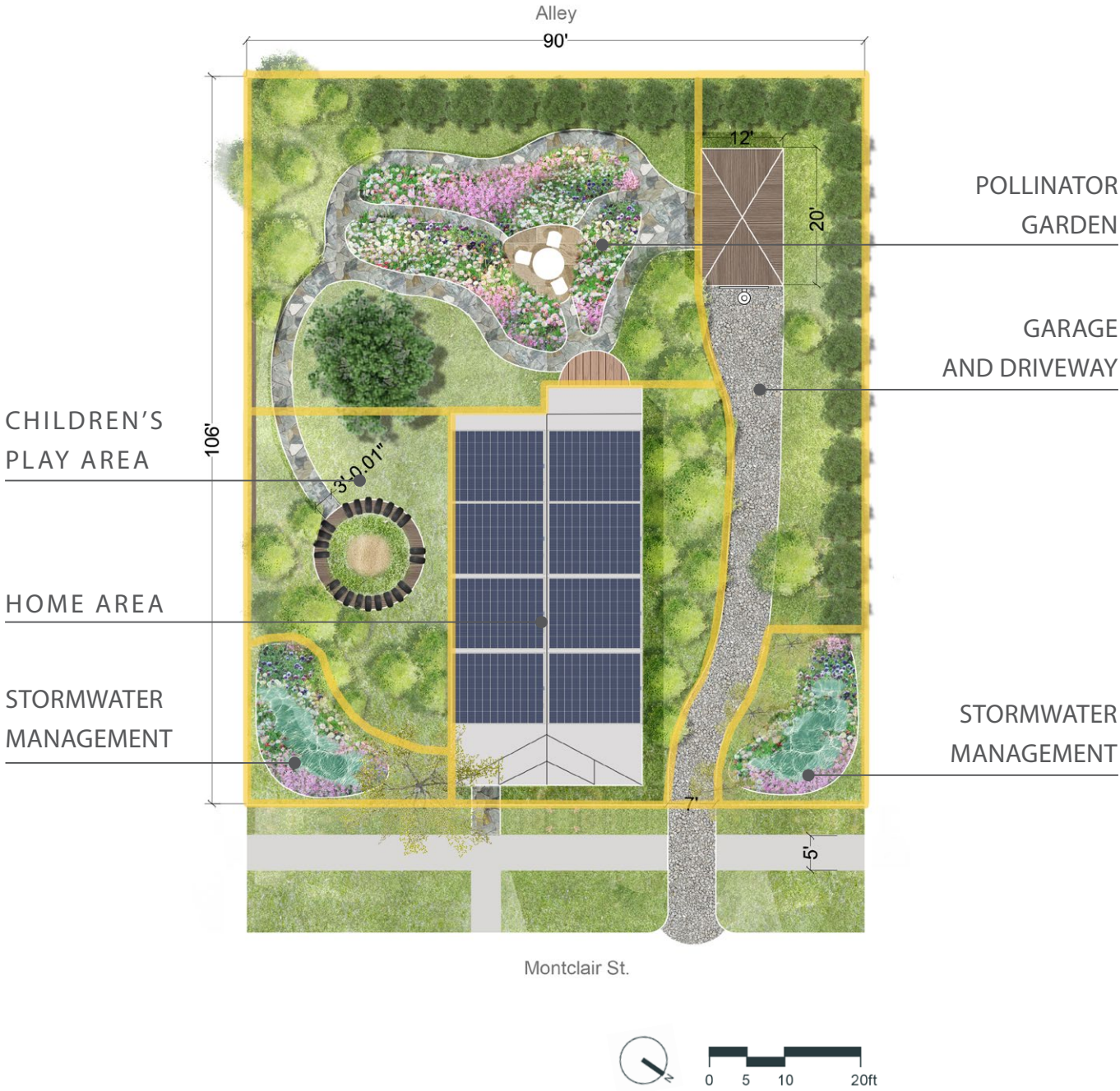
### Preliminary Takeoff (7,800sf): Home Lot + One Lots

DESCRIPTION	SQUARE FOOTAGE
Home Area	2,646
Garage and Driveway	957
Planting Areas	1,915
Children's Play Area	1,735
Stormwater Management	547
<b>Total</b>	<b>7,800</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



**ACCESSORY STRUCTURE LOT - BOTH SIDES**



**Preliminary Cost Estimate**

Material costs: \$3.87/sf

DESCRIPTION	MATERIAL COST	
<b>Home Area</b>		
Native Plant Plugs	Subtotal Home Area: \$13,263	
Pavers, including base materials		
Solar Power Kit		
<b>Garage and Driveway</b>		
Single Car Garage	Subtotal Garage and Driveway: \$10,115	
Garage Foundation		
Evergreen Hedge		
Gravel Driveway		
<b>Pollinator Garden</b>		
Pavers, including base materials	Subtotal Pollinator Garden: \$8,457	
Shrub (#5)		
Evergreen Hedge		
Wood Deck		
Native Plant Plugs		
36'' Split Rail Fence		
Bistro Table + 3 chair		
<b>Children's Play Area</b>		
Pavers, including base materials	Subtotal Children's Play Area : \$1,699	
Shrub (#5)		
36'' Split Rail Fence		
Recycled Tires		
Sand, 6" depth	Subtotal Stormwater Management : \$3,359	
<b>Stormwater Management</b>		
Shrub (#5)		
Rain Garden Plants		

**Preliminary Takeoff (9,540sf): Home Lot + One Lots**

DESCRIPTION	SQUARE FOOTAGE
Home Area	2,249
Garage and Driveway	1,972
Pollinator Garden	3,166
Children's Play Area	1,295
Stormwater Management	858
<b>Total</b>	<b>9,540</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.

### ACCESSORY STRUCTURE LOT - MERGED

#### Preliminary Takeoff (11,700sf): Home Lot + Two Lots

DESCRIPTION	SQUARE FOOTAGE
Home Area	1,632
Garage and Driveway	1,923
Hoop House Area	1,606
Children's Play Area	1,962
Backyard Garden	903
Community Event Area	899
Art Lot Area	1,508
Stormwater Management	1,267
<b>Total</b>	<b>11,700</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



#### Preliminary Cost Estimate

Material costs: \$4.12/sf

DESCRIPTION	MATERIAL COST
<b>Home Area</b>	
<a href="#">Native Plant Plugs</a>	
<a href="#">Pavers, including base materials</a>	
<a href="#">Solar Power Kit</a>	
	Subtotal Home Area: \$12,260
<b>Garage and Driveway</b>	
<a href="#">Two-Car Garage</a>	
<a href="#">Garage Foundation</a>	
<a href="#">Asphalt Driveway</a>	
<a href="#">36" Split Rail Fence</a>	
	Subtotal Garage and Driveway: \$17,413
<b>Hoop House Area</b>	
<a href="#">Shrub (#5)</a>	
<a href="#">36" Split Rail Fence</a>	
<a href="#">Hoop House (10' x 3')</a>	
<a href="#">Pavers, including base materials</a>	
	Subtotal Hoop House Area: \$1,964
<b>Children's Play Area</b>	
<a href="#">Shrub (#5)</a>	
<a href="#">Evergreen Hedge</a>	
<a href="#">Bounce Castle</a>	
	Subtotal Children's Play Area: \$1,470
<b>Community Event Area</b>	
<a href="#">Pavers, including base materials</a>	
<a href="#">Native Plant Plugs</a>	
<a href="#">36" Split Rail Fence</a>	
<a href="#">Cedar Frame Gazebo</a>	
<a href="#">Composite Flower Bed Edging</a>	
	Subtotal Community Event Area: \$4,465
<b>Backyard Garden</b>	
<a href="#">Wood Deck</a>	
<a href="#">Shrub (#5)</a>	
<a href="#">Pea Gravel, 3" depth</a>	
	Subtotal Backyard Garden: \$3,505
<b>Art Lot Area</b>	
<a href="#">Pavers, including base materials</a>	
<a href="#">Bistro Table + 3 chair</a>	
<a href="#">Recycled Tires</a>	
<a href="#">Drawing Board(48" x 72")</a>	
<a href="#">Rubber Mulch, 3" depth</a>	
	Subtotal Art Lot Area: \$3,443
<b>Stormwater Management</b>	
<a href="#">Native Plant Plugs</a>	
<a href="#">Evergreen Hedge</a>	
<a href="#">Plants</a>	
<a href="#">Composite Flower Bed Edging</a>	
	Subtotal Stormwater Management : \$3,679
<b>Total: \$48,198</b>	



### OVERSIZE LOT - COMMUNITY HAVEN



### Preliminary Cost Estimate

Material costs: \$4.28/sf

DESCRIPTION	MATERIAL COST
<b>Art and Display</b>	
Sodded Lawn	
Wood Deck	
Pavers, including base materials	
Pavilion	
Wood Bench	Subtotal Art and Display: \$15,886
<b>Community Meeting Space</b>	
Sodded Lawn	
Pavers, including base materials	
Wood Deck	
Wooden Picnic Table	
Wood Bench	Subtotal Community Meeting Space: \$10,124
<b>Planting Area</b>	
Pea Gravel, 3" depth	
Raised Planting Beds	
Planting Soil	Subtotal Planting Area: \$1,964
<b>Lawn Area</b>	
Pavers, including base materials	
Shrub (#5)	
Sodded Lawn	Subtotal Lawn Area: \$4,161
<b>Total: \$32,135</b>	

### Preliminary Takeoff (7,500sf): One Lot

DESCRIPTION	SQUARE FOOTAGE
Art and Display	2,435
Planting Areas	1,470
Community Meeting Space	2,035
Lawn Area	1,560
<b>Total</b>	<b>7,500</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



**NEIGHBORHOOD LOT - NATIVE GARDEN**



**Preliminary Cost Estimate**

Material costs: \$2.93/sf

DESCRIPTION	MATERIAL COST
<b>Community Garden Area</b>	
Pavers, including base materials	Subtotal Community Garden Area: \$5,166
Pea Gravel, 3" depth	
Raised Planting Beds	
Planting Soil	
Shrub (#5)	
Evergreen Hedge	
Wood Bench	
<b>Gathering Space</b>	
Pavers, including base materials	Subtotal Gathering Space: \$3,790
Drawing Board(48" x 72")	
Planting Soil	
Wood Bench	
<b>Stormwater Management</b>	
Shrub (#5)	Subtotal Stormwater Management: \$3,633
Rain Garden Plants	
Wood Bench	
<b>Lawn Area</b>	
Sodded Lawn	Subtotal Lawn: \$6,770
Pavers, including base materials	
Shrub (#5)	
Evergreen Hedge	
<b>Total: \$19,359</b>	

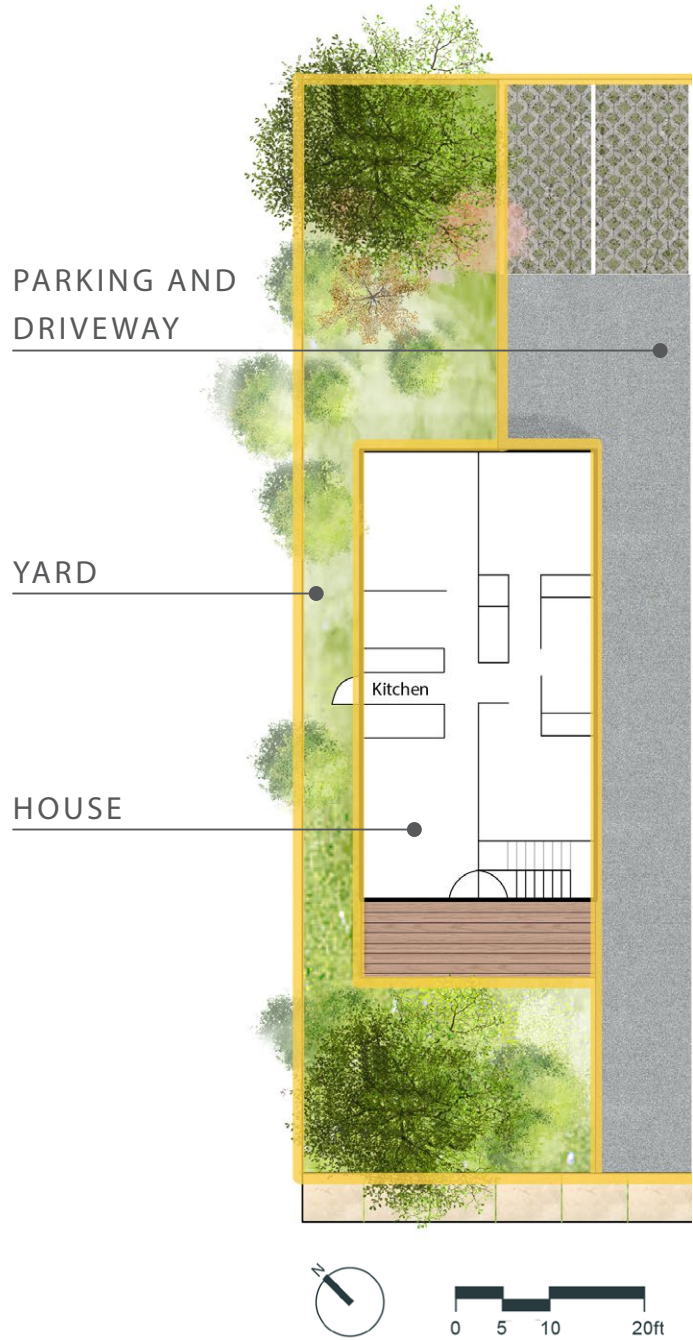
**Preliminary Lot Takeoff (6,600sf): Two Lots**

DESCRIPTION	SQUARE FOOTAGE
Community Garden Area	1,870
Gathering Space	500
Stormwater Management	1,460
Lawn	2,770
<b>Total</b>	<b>6,600</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



**INFILL LOT - DUPLEX DESIGN**



**Preliminary Cost Estimate**

Material costs: \$59.8/sf

DESCRIPTION	MATERIAL COST
<b>House</b>	
<a href="#">Home (two-story)</a>	Subtotal House: \$257,472
<a href="#">Wood Deck</a>	
<b>Parking and Driveway</b>	
<a href="#">Concrete Driveway</a>	Subtotal Parking and Driveway: \$8,300
<a href="#">Permeable Parking</a>	
<b>Yard</b>	
<a href="#">Sodded Lawn</a>	Subtotal Yard: \$2,125
<a href="#">Shrub (#5)</a>	
<a href="#">Street Tree, assume 3" caliper</a>	
<b>Total: \$267,897</b>	

**Preliminary Takeoff (4,480sf): One Lot**

DESCRIPTION	SQUARE FOOTAGE
Community Garden Area	1,296
Parking and Driveway	1,690
Yard	1,494
<b>Total</b>	<b>4,480</b>

*Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.*

**HOMESTEAD LOTS - COMMUNITY GARDEN**



**Preliminary Cost Estimate**

Material costs: \$2.2/sf

DESCRIPTION	MATERIAL COST
<b>Home Area</b>	
Sodded Lawn	
Wood Deck	
Shrub (#5)	
Permeable Parking	
Subtotal Home Area: \$7,872	
<b>Gathering Space</b>	
Sodded Lawn	
Pavers, including base materials	
Wooden Picnic Table	
Shrub (#5)	
Evergreen Hedge	
Subtotal Gathering Space: \$3,850	
<b>Stormwater Management</b>	
Sodded Lawn	
Shrub (#5)	
Rain Garden Plants	
Subtotal Stormwater Management: \$4,601	
<b>Community Garden</b>	
Pea Gravel, 3" depth	
Raised Planting Beds	
Planting Soil	
Wood Deck	
Subtotal Community Garden: \$6,865	
<b>Total: \$23,188</b>	

**Preliminary Takeoff (10,530sf): Home Lot + Two Lots**

DESCRIPTION	SQUARE FOOTAGE
Home Area	2,750
Gathering Space	1,961
Stormwater Management	1,683
Community Garden	4,136
<b>Total</b>	<b>10,530</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



### HOMESTEAD LOTS - SOCCER FIELD



### Preliminary Cost Estimate

Material costs: \$1.52/sf

DESCRIPTION	MATERIAL COST
<b>Home Lot</b>	
Pavers, including base materials	Subtotal Home Lot: \$1,729
Wood Deck	
<b>Soccer Field</b>	
Paint	Subtotal Soccer Field: \$3,685
Soccer Goal Posts	
Sodded Lawn Field	
<b>Surrounding Features</b>	
Sodded Lawn	Subtotal Surrounding Features: \$21,286
Pavers, including base materials	
Wooden Picnic Table	
Wood Deck	
Shrub (#5)	
<b>Total: \$26,700</b>	

### Preliminary Takeoff (17,550sf): Home Lot + Two Lots

DESCRIPTION	SQUARE FOOTAGE
Home Lot	3,510
Soccer Field	6,110
Surrounding Features	1,683
<b>Total</b>	<b>17,550</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.

### HOMESTEAD LOTS - BASKETBALL COURT



### Preliminary Cost Estimate

Material costs: \$6.36/sf

DESCRIPTION	MATERIAL COST
<b>Home Lot</b>	
<a href="#">Wood Bench</a>	Subtotal Home Lot: \$6,905
<a href="#">Wood Deck</a>	
<b>Basketball Courts</b>	
<a href="#">Concrete Slab</a>	Subtotal Basketball Court: \$88,760
<a href="#">Polypropylene Tile</a>	
<a href="#">Game lines Painting</a>	
<a href="#">Hoop</a>	
<b>Surrounding Features</b>	
<a href="#">Sodded Lawn</a>	Subtotal Surrounding Features: \$15,830
<a href="#">Pavers, including base materials</a>	
<a href="#">Shrub (#5)</a>	
<b>Total: \$111,537</b>	

### Preliminary Takeoff (17,550sf): Home Lot + Four Lots

DESCRIPTION	SQUARE FOOTAGE
Home Lot	3,510
Basketball Courts	7,650
Surrounding Features	6,390
<b>Total</b>	<b>17,550</b>

Costs listed are strictly estimates and should be used for rough budgeting purposes only. These costs represent material costs and do not include the cost of purchasing the land, permitting, installation, delivery, site preparation, utilities, lighting, and maintenance.



## APPENDIX B: OTHER ALLOWABLE ACCESSORY STRUCTURES

### Allowable Accessory Uses and Structures on Urban Farms

- Aquaculture
  - Hydroponics
  - Aquaponics
- Barns and/or other buildings for storage
- Structures for cold storage and processing

REFER TO SEC. 50-12-522/3. Buildings, Safety Engineering, and Environmental Department  
 (“Plot Plan, Site Design, and Maintenance Guide”)

### Allowable Accessory Uses and Structures on Urban Gardens

- Hoop houses or high tunnels
- Green houses
- Farm stands for on-site sales

REFER TO SEC. 50-12-522. Buildings, Safety Engineering, and Environmental Department

Buildings over 200 square feet (residential zoning) or 120 square feet (all other zoning) require building permits. (“Plot Plan, Site Design, and Maintenance Guide”)

#### AQUACULTURE (INTEGRATED RECYCLING SYSTEMS)



SOURCE: Agricultural Marketing Resource Center

#### HYDROPONICS



SOURCE: www.delawareonline.com/

#### AQUAPONICS



SOURCE: www.coloradoaquaponics.com/

#### GREENHOUSE



SOURCE: Pinterest

#### FARM STAND



SOURCE: Pinterest

#### HOOP HOUSE



SOURCE: https://moenvironment.org/

## HOOP HOUSES

Hoop Houses are small, semi-mobile greenhouse structures used for initial seeding and the cultivation of heat-loving vegetables. Hoop Houses provide frost protection, limited insect protection and an extended vegetable growing season. Hoop Houses are easy to build and last for many years. (“Community Garden Guide Season Extension - Hoop Houses”)

### Benefits:

- Remove seasonal plant dependence.
  - Cost effective
  - Good soil management
  - Provide fresh produce to meet demand.
  - Easy to assemble.
  - Provide more work and activity space indoors.
  - The structure is quite robust and can withstand bad weather well.
- (“Community Garden Guide Season Extension - Hoop Houses”)



SOURCE: Backwoods Mama

## GREENHOUSE

This artificial insulation facility is mainly used for growing vegetables in the off-season. Made with either plastic or glass, the humidity and temperature in the greenhouse can be manually adjusted. (“Greenhouse | Definition, Types, and Uses”)

### Benefits:

- Increase production.
  - Maximize profits with limited farming space.
  - Make farming regardless of season.
  - Minimize production costs.
  - Better control of weeds, pests and diseases.
- (“Greenhouse | Definition, Types, and Uses”)

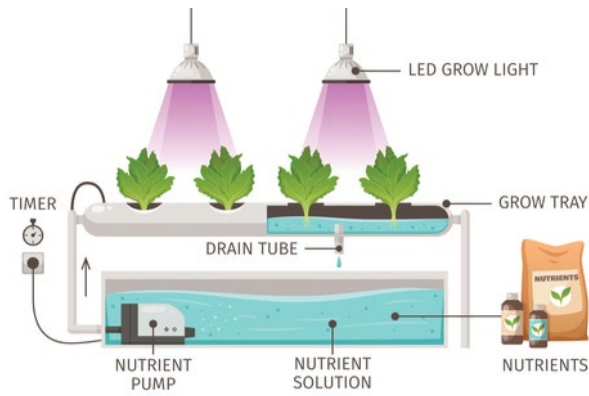


SOURCE: Home & Garden Information Center



### HYDROPONICS

Hydroponics is the process of growing plants without soil. In hydroponics, plants are grown in a medium such as rock or coconut fiber and are sprayed with a solution containing a mixture of primary, secondary and micro-nutrients. Almost any plant can be hydroponic, including vegetables, herbs, fruits and flowers. (“What Exactly Is Hydroponics”)



SOURCE: www.growsomegivesome.org

**Benefits:**

- Plants grow 50% faster than in soil.
- Hydroponic products usually contain more nutrients than conventionally grown products
- Plants grown in sterile media grow rapidly and are resistant to pests and diseases.
- They use smaller containers to save space
- Since no competing nutrients are needed, more plants can be grown in smaller areas.
- Increased control over growing conditions makes it easier to provide the best possible environment for plants, thereby improving product quality and yield.
- No weeding is required and requires less labor than planting in the soil.

(“What Exactly Is Hydroponics”)

### AQUACULTURE (INTEGRATED RECYCLING SYSTEMS)

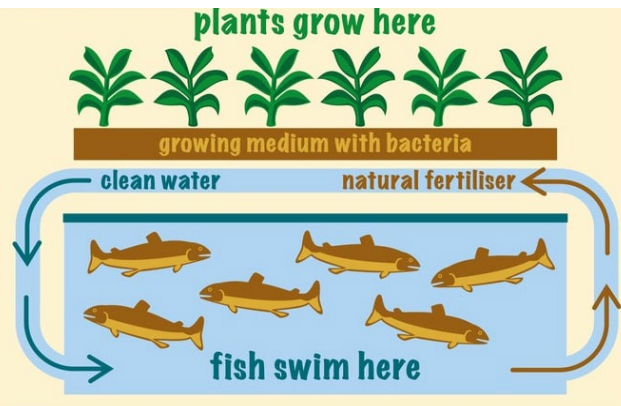
The integrated recycling system is arguably the largest “pure” method of fish farming, using large plastic tanks placed in greenhouses to raise fish. The waste produced by the fish is transferred to a nearby hydroponic bed to provide nutrients for crops growing in the bed. Most types of plants grown in hydroponic beds are herbaceous. (“Fish Farms | Fish Farming Information and Resources | Farms.Com”)



SOURCE: The Fish Site

### AQUAPONICS

Aquaponics is the combination of hydroponic and aquaculture, where farmed fish and hydroponic plants are placed in one united system. Plants get their food from the waste of aquatic animals. In return, the vegetables clean the water that the fish live in. Additionally, microorganisms play an important role in plant nutrition as well. These beneficial bacteria congregate in the spaces between plants’ roots, converting fish waste and solids into something that plants can use to grow. (North, 2016)



SOURCE: https://phys.org/news/

**Benefits:**

- The symbiotic relationship between fish and vegetable allows the opportunity to grow fish and vegetables at the same time.
- There is no need to use fertilizers.
- In eco-hydroponics, less water is used for crops.
- Regular garden pesticides and other chemicals are not used.
- Produce healthier organic vegetables.
- Eliminate soil-borne diseases.
- Save space and maximize benefits
- Plants grow rapidly.

(North, 2016)



## APPENDIX C: INFILL LOTS

### Submission Process:

1. A buyer needs to submit a thorough project plan, including financing and design documents. These items will be reviewed by the DLBA and City Planning staff in order to determine acceptance of application.
2. Factors included in the decision making process include offer price, community benefit, purchaser experience and financial capability, purchaser connection to the neighborhood, proposed use of the lot, and support of neighbors and local organizations.

### Affordable Housing Discount Opportunities:

1. 50% off of the purchase price of land, if at least 25% of the units are affordable to those earning no more than 80% of AMI; or
2. 80% off of the purchase price of land, if at least 25% of units are affordable to those earning no more than 50% of AMI.

Affordable housing units are subject to monitoring by the City's Civil Rights, Inclusion & Opportunity Department for 10 years.

### Other Discount Opportunities:

1. City employee discount
2. Detroit school employee discount
3. Skilled trade employment program discount
4. Home-buyer counseling discount
5. A purchaser may also be eligible for discounts offered through the DLBA's Projects Procedures and Guidelines. However, a purchaser shall not receive a cumulative total discount of more than 90% for the purchase of any Infill Housing Lot.

*Other financing resources can be found in the resource section of this book.*

## APPENDIX D: CLIMATE ADAPTATION RESILIENT COMMUNITIES

### COMMUNITY RESPONSE

By identifying local needs and concerns, communities can assess vulnerability, facilitate communication and information sharing, and coordinate action. ("Prepare Your Community for a Flood Emergency")



Hosting regular community meetings to discuss community response plans  
SOURCE: SmithGroup

### Identify hazards and impacts

The first step in helping communities prepare for an emergency is understanding the risks. Identify hazards and their effects, such as how the source of floods will affect the accessibility of roads or communication channels, and then identify areas at risk. ("Prepare Your Community for a Flood Emergency")

### Build strong connections

By building community ties before an emergency occurs, your community will have greater social cohesion and be better able to recover after an emergency. Making good connections in the community can help you get to know your neighbors and get to know vulnerable people in the community, such as people with disabilities, children, the elderly and those with few resources. Actively liaise with local organizations to find places where communities can meet to discuss local needs and concerns, or to host their own meetings. ("Prepare Your Community for a Flood Emergency")

### Make community response plan

During extreme flooding events, falling trees, high water levels, and other problems can make certain driving routes impassable. There are several escape routes that can be identified through a pre-established local flood evacuation plan to avoid congestion. Where feasible, it would be desirable to arrange shared transport. For public transportation, contact local government emergency management to ask how to evacuate, where the staging area is, and any other problems people may have. For communities to be more successful in sharing information, coordinating actions, and communicating with other organizations during an emergency, they need to identify a low-risk area to meet and prepare community assets and resources (e.g., radios, telephones, energy), and rehearse these plans. ("Prepare Your Community for a Flood Emergency")

**COMMUNITY RATING SYSTEMS**

The Community Rating System (CRS) is a voluntary incentive program designed to encourage communities to implement flood risk reduction measures, meaning that communities that take additional actions to reduce flood risk can qualify for the flood insurance benefits offered to their residents by the National Flood Insurance Program (NFIP). (“Community Rating System”)



SOURCE: www.floodsmart.gov

**Benefits:**

Depending on the number and type of specific risk reduction actions undertaken by the community, CRS discounts range from 5% to 45%. Communities can earn discounts by accumulating points. These points are earned for initiatives that increase their ability to share flood risk information, map and manage flood plain development, reduce potential flood damage to existing buildings, and provide early flood warning and response to flood events. Other permanent risk-reduction actions, such as preserving open space, restricting development in high-risk areas, and acquiring and relocating high-risk buildings, can earn communities more points. (“Take Action to Reduce Flood Risk with the Community Rating System”)

**CRS Credit Points, Classes and Premium Discounts**

A higher overall score corresponds to a higher CRS “class” rating, meaning its residents get a bigger discount on flood insurance policies. The table below shows the discounts corresponding to each CRS rate category. (SFHA = Special Flood Hazard Area ) (“Take Action to Reduce Flood Risk with the Community Rating System”)

Credit Points	Class	Premium Reduction SFHA	Premium Reduction Non-SFHA
4500+	1	45%	10%
4000-4499	2	40%	10%
3500-3999	3	35%	10%
3000-3499	4	30%	10%
2500-2999	5	25%	10%
2000-2499	6	20%	10%
1500-1999	7	15%	5%
1000-1499	8	10%	5%
500-999	9	5%	5%
0-499	10	0%	0%

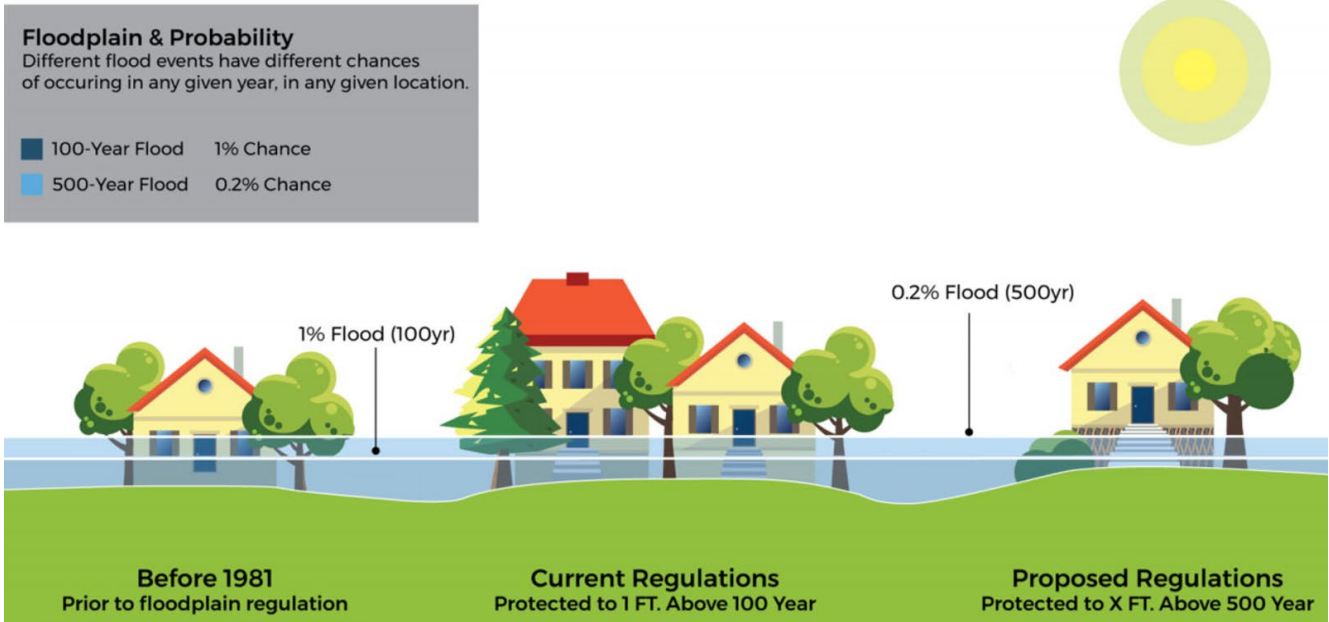
SOURCE: www.fema.gov/floodplain-management/community-rating-system

**FLOODPLAIN ORDINANCES**

Communities can address flood risk issues by passing laws and requirements for land and development, such as construction requiring houses to be raised to a certain height. Flood plain regulations can also limit or ban development in flood-prone areas to reduce long-term risks. (“Flood Solutions”)

**Limited floodplain development**

Limiting development on flood plains is one of the most effective ways to reduce a community’s flood risk and reduce future losses. (“Flood Solutions”)



Elevating a home in a flood-prone area reduces the risk of flooding for that property. SOURCE: Hurricane Harvey Recovery: A Progress Report

**Minimum floodplain management standards**

Many communities have adopted and implemented minimum flood plain management standards required by the National Flood Insurance Program (NFIP). (https://www.ecfr.gov/current/title-44/part-60). Federal Emergency Management Agency estimates that over the past 40 years, the nation has saved more than \$100 billion by adopting these standards. These standards consist of the following key components: (“Part 60 -- Criteria for Land Management and Use”)

- A flood plain with a 1% chance of flooding each year, also known as a special flood hazard area (SFHA), where development requires a permit;
- The minimum floor height of all new residential buildings in the SFHA should be at or above the predicted height of floodwaters in the 1% annual chance flood;
- Restrictions regulate development within the flood channel to limit increased flood risk;
- Specific building materials and methods are needed to reduce future flood losses. (“Part 60 -- Criteria for Land Management and Use”)



## MANAGED RETREAT

In some areas, communities are considering moving people and property out of flood-prone areas. That land could then be used to build additional flood-control infrastructure or transition to public lands such as parks or open spaces. (“Participate in Buyouts and Acquisition Programs”)

### Acquisition programs

An acquisition is a government purchase of private property for public use. This process includes the purchase of a property within the flood-way to reduce future flooding damage to the site and/or the vicinity of the acquired property. (“Participate in Buyouts and Acquisition Programs”)

### Buyout programs

Buyouts are a specific subset of real estate acquisitions that include the purchase of private land, demolition of existing buildings, and permanent use of undeveloped land for public use. (“Participate in Buyouts and Acquisition Programs”)

### Benefits:

Voluntary buyouts and acquisition often offer homeowners an opportunity to leave high-risk areas. Under the buyouts, the purchase price of a house is based on fair market value before the flood. In addition, these projects provide a permanent form of flood protection, completely removing people from flood risk and subsequently converting these properties into open space permanently. (“Participate in Buyouts and Acquisition Programs”)

### Home purchase eligibility

Acquisitions and acquisition programs are typically funded by federal entities, such as the Federal Emergency Management Agency (FEMA) or the Department of Housing and Urban Development (HUD), however state and local governments manage and sometimes finance buy-outs as well. The implementation of these plans do not have to occur after a disaster. If your home has been affected by a flood, the best way is to find out if your home is eligible to be purchased is to contact your local government offices or a FEMA regional office (<https://www.fema.gov/locations/michigan>) and ask if there are programs available in your area. (“Participate in Buyouts and Acquisition Programs”)

### Limitations:

It is worth noting that for acquisitions and buyouts programs, even after major disaster events, stakeholders often outnumber funds. In addition, it often takes months or even years to sell a home through these federal programs from application to completion, so it can be difficult to continue paying for repairs and housing until the transfer of property is fully realized. (“Participate in Buyouts and Acquisition Programs”)



Flood water at the junction of Seneca St. and Moffat Ave  
Photo by team member

## APPENDIX E: COMMUNITY ENGAGEMENT NEIGHBORHOOD PLANNING SURVEY

### SURVEY QUESTIONS

#### SECTION 1

#### 1. What is your age?

- |                                |                             |  |
|--------------------------------|-----------------------------|--|
| <input type="radio"/> Under 12 | <input type="radio"/> 30-39 | <input type="radio"/> 75+                  |
| <input type="radio"/> 13-17    | <input type="radio"/> 40-49 | <input type="radio"/> Prefer not to answer |
| <input type="radio"/> 18-29    | <input type="radio"/> 50-74 |  |

#### 2. What is your gender?

- |                              |                            |                                  |
|------------------------------|----------------------------|----------------------------------|
| <input type="radio"/> Female | <input type="radio"/> Male | <input type="radio"/> Non-binary |
| <input type="radio"/> Other  |                            |                                  |

#### 3. What is your race?

- |   |   |  |
|---|---|--|
| <input type="radio"/> Black                               | <input type="radio"/> White                       | <input type="radio"/> Asian                |
| <input type="radio"/> Hispanic/Latinx                     | <input type="radio"/> MiddleEastern/North African | <input type="radio"/> Indigenous           |
| <input type="radio"/> Native Hawaiian or Pacific Islander | <input type="radio"/> Multiracial                 | <input type="radio"/> Prefer not to answer |
| <input type="radio"/> Other                               |   |  |

#### 4. What is the primary language of your household?

- |                               |                               |                              |
|-------------------------------|-------------------------------|------------------------------|
| <input type="radio"/> English | <input type="radio"/> Spanish | <input type="radio"/> Arabic |
| <input type="radio"/> Other   |                               |                              |

## SURVEY QUESTIONS

### SECTION 2

#### 5. What neighborhood do you live in?

- Gratiot Town/Kettering
- Gratiot Woods
- Gratiot-Grand
- Pingree Park
- Poletown East
- Indian Village
- Other

#### 6. How many years have you lived in your neighborhood?

- Less than 1 year
- 1-5 years
- 6-10 years
- More than 10 years

#### 7. What do you like the most about your neighborhood?

- Open green space (ie: parks, gardens, walking trails)
- Restaurants and entertainment
- Shopping and retail centers
- Walkable neighborhood
- Reliable public transit
- Bike lanes
- Access to public amenities (ie recreation centers)
- Ease of access to daily destinations
- Strong sense of community
- Other

#### 8. What makes your neighborhood special?

- \_\_\_\_\_

#### 9. What are the most critical issues you find in your community? [Select all that apply]

- Lack of commercial opportunities
- Dilapidated sidewalks and streets
- Insufficient affordable housing opportunities
- Exposure to outdoor air pollution
- Lack of youth & family-friendly spaces
- Extreme flooding after heavy rainfall
- Inadequate access to healthy food
- Littering and illegal dumping
- Unsafe homes (ie: lead in water or paint)
- Inadequate access to transportation
- Other

## SURVEY QUESTIONS

### SECTION 2

#### 10. What are some of the things you would like to see improve in your neighborhood? (Select all that apply)

- Ways to get around better (e.g. biking, walking, bus)
- More retail, dining, and entertainment options
- Demolishing or repairing vacant buildings
- Places to play and exercise
- More places to enjoy nature (e.g. birds, trees, flowers, butterflies, etc.)
- Other

#### 11. How often do you walk to work, school, or other destinations?

- Always
- Sometimes
- Never
- Other

#### 12. Do you think your community has easy access to green space without traveling more than 10 minutes to reach this space? (ie: parks, gardens, natural spaces). On a scale of 1-5 with 1 being limited access and 5 being full access.

- |                |                       |                       |                       |                       |                       |             |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|
|                | 1                     | 2                     | 3                     | 4                     | 5                     |             |
| Limited access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Full access |

#### 13. Does your neighborhood ever experience effects of extreme weather? This could include flooding, long-term temperatures over 95 degrees or poor air quality among other factors.

- Yes
- No
- Other

#### 14. If yes, please describe below the effects that your community experiences.

- \_\_\_\_\_

#### 15. How safe do you feel in your neighborhood? With 1 being not safe and 5 being very safe.

- |          |                       |                       |                       |                       |                       |           |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
|          | 1                     | 2                     | 3                     | 4                     | 5                     |           |
| Not safe | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Very safe |

#### 16. Based on how you answered your previous question why did you rate your neighborhood in this way?

- \_\_\_\_\_



# APPENDIX F: COMMUNITY ENGAGEMENT VISUAL PREFERENCE SURVEY

## SURVEY QUESTIONS

### SECTION 1

**1. What is your age?**

- Under 12
- 13-17
- 18-29
- 30-39
- 40-49
- 50-74
- 75+
- Prefer not to answer

**2. What is your gender?**

- Female
- Other
- Male
- Non-binary

**3. What is your race?**

- Black
- Hispanic/Latinx
- Native Hawaiian or Pacific Islander
- Other
- White
- MiddleEastern/North African
- Multiracial
- Asian
- Indigenous
- Prefer not to answer

**4. What is the primary language of your household?**

- English
- Other
- Spanish
- Arabic

**5. What neighborhood do you live in?**

- Gratiot Town/Kettering
- Pingree Park
- Other
- Gratiot Woods
- Poletown East
- Gratiot-Grand
- Indian Village

**6. How many years have you lived in your neighborhood?**

- Less than 1 year
- More than 10 years
- 1-5 years
- 6-10 years

## SURVEY QUESTIONS

### SECTION 2

**7. How important is revitalizing vacant lots in Kettering to you?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

**8. How important is improving existing parks in Kettering to you?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

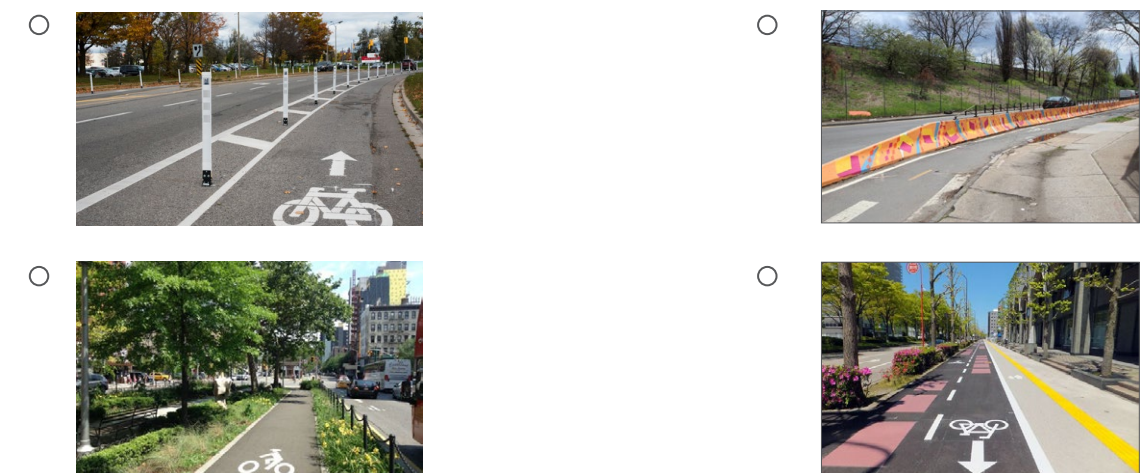
**9. How important is having space for vendors in Kettering to you? (Food trucks, beer garden, arts and crafts, etc.)**

- I really don't want it
- I would prefer not to have it
- I really want it

**10. How important to you are designated bike lanes in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

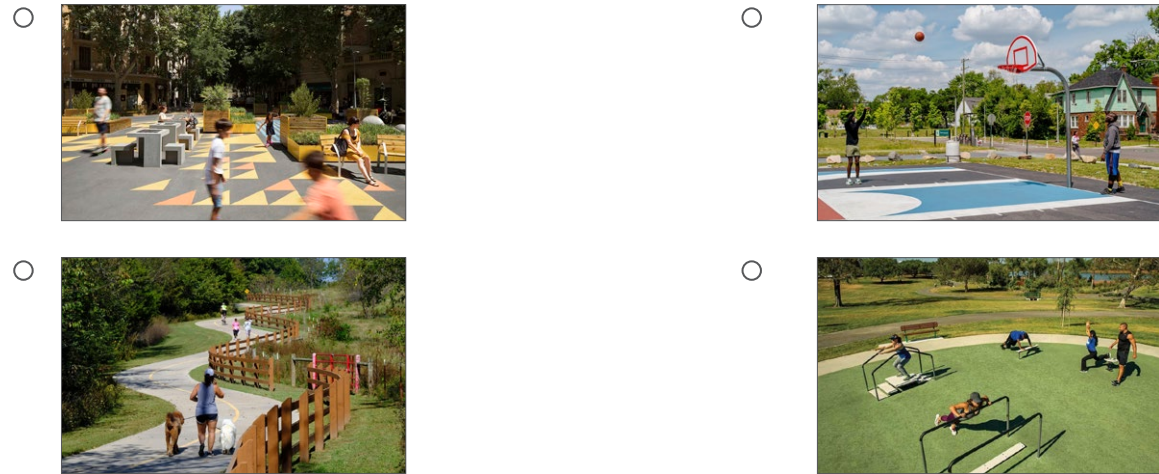
**11. Which of these bike lanes do you see best fitting in your community?**



**12. How important to you are areas for active recreation in your community? (volleyball, basketball, pickleball, exercise equipment etc.)**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

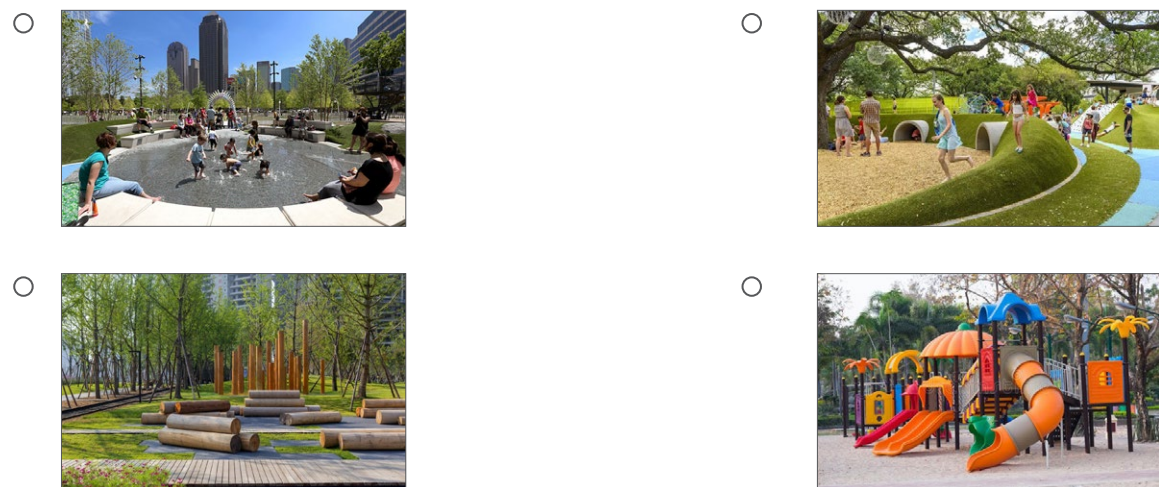
**13. Which of these active recreation spaces do you see best fitting in your community?**



**14. How important to you are children's play spaces in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

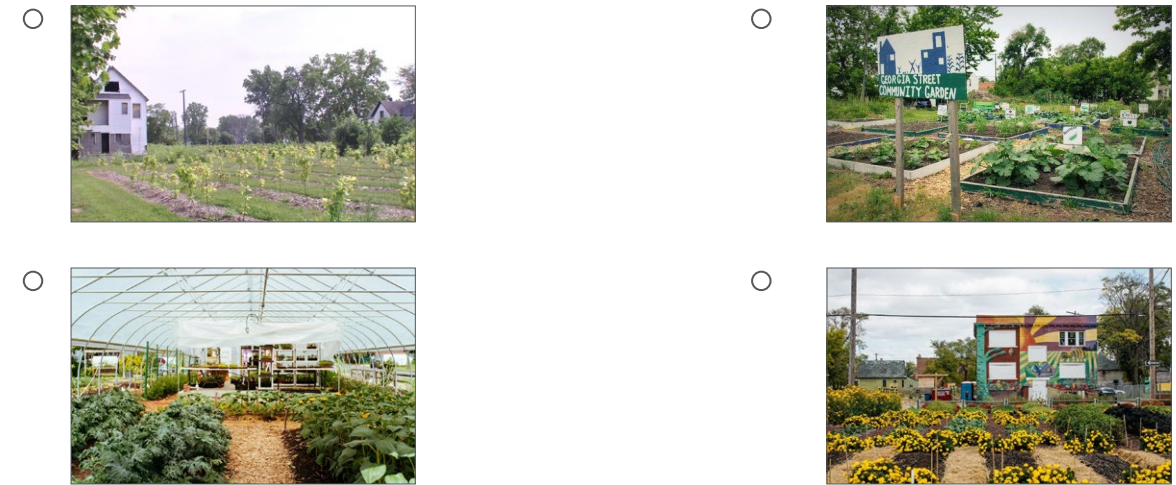
**15. Which of the following children's play spaces do you see best fitting in your community?**



**16. How important to you is urban agriculture in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

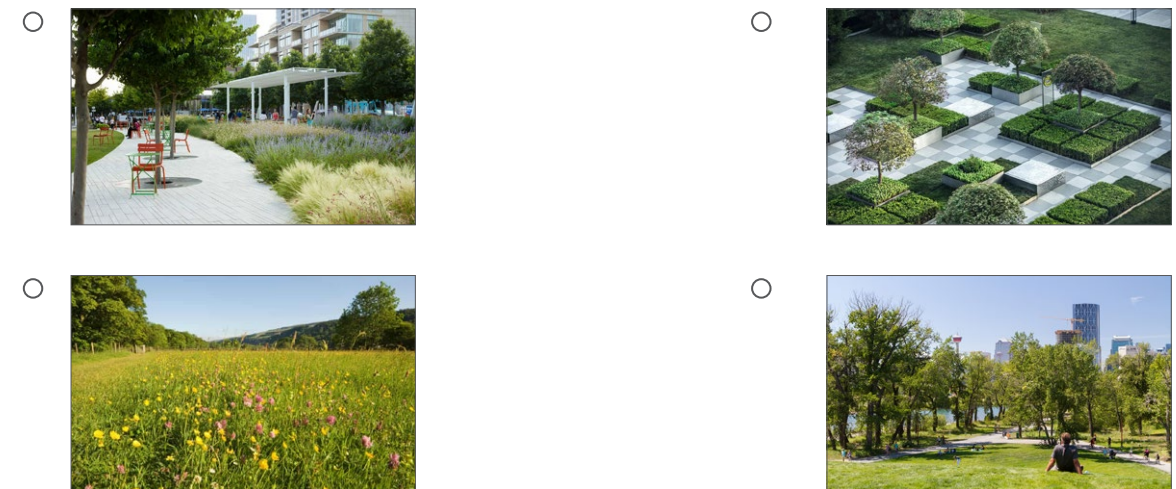
**17. Which of the following urban agriculture do you see best fitting in your community?**



**18. How important to you is having plantings in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

**19. Which of the following planting styles do you prefer?**







**20. How important to you is having renewable resources in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it







21. Which of the following renewable resources do you prefer?

- 
- 
- 
- 

22. How important to you is a place for events in your community?

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it


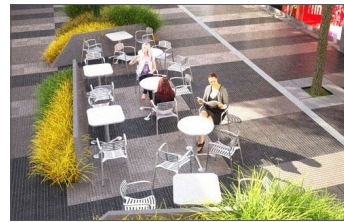


23. Which of the following event spaces do you prefer?

- 
- 
- 
- 

24. How important to you are places to sit in your community?

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it





25. Which of these seating spaces do you see best fitting in your community?

- 
- 
- 
- 

26. How important to you are public work spaces in your community?

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

27. Which of the following public work spaces do you prefer?





- 
- 
- 
- 

28. How important to you are water features in your community?

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it



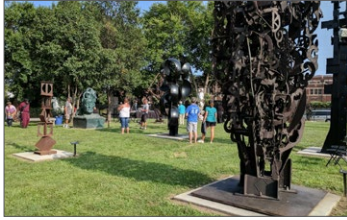



**29. Which of the following water features do you see best fitting in your community?**

- 
- 
- 
- 

**30. How important to you is public art in your community?**

- I really don't want it
- I would prefer not to have it
- I really want it
- Doesn't matter to me either way
- I would prefer to have it

**31. Which of the following public art features do you see best fitting in your community?**

- 
- 
- 
- 

**32. Please select the top 3 most important features that you would like to see incorporated into your community. (Choose only 3)**

- Public work spaces
- Active recreation areas
- Children's play spaces
- Other
- Urban Agriculture
- Planting areas
- Event spaces
- Water features
- Public art
- Seating areas

**SURVEY QUESTIONS**

**SECTION 3**

**33. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like**

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



**34. What did you like or dislike about this space?**

\_\_\_\_\_

**35. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like**

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like

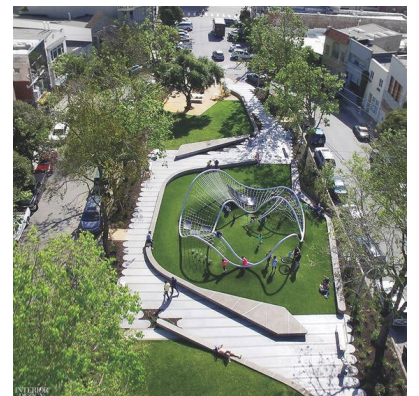


**36. What did you like or dislike about this space?**

\_\_\_\_\_

**37. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like**

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



**38. What did you like or dislike about this space?**

\_\_\_\_\_



39. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



40. What did you like or dislike about this space?

\_\_\_\_\_

41. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



42. What did you like or dislike about this space?

\_\_\_\_\_

43. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



44. What did you like or dislike about this space?

\_\_\_\_\_

45. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



46. What did you like or dislike about this space?

\_\_\_\_\_

47. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like

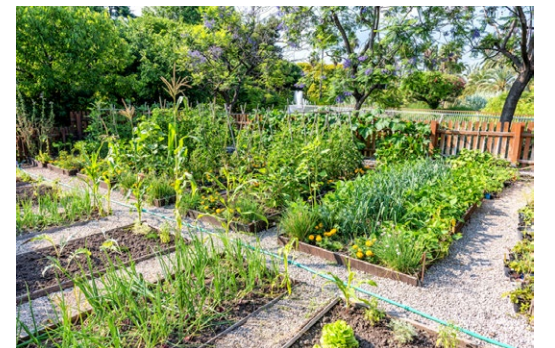


48. What did you like or dislike about this space?

\_\_\_\_\_

49. Please rate this space on a scale of 1-5, with 1 being strong dislike, 3 being indifference, and 5 being strong like

- 1 Strong Dislike
- 2
- 3
- 4
- 5 Strong Like



50. What did you like or dislike about this space?


\_\_\_\_\_

51. Is there any other information you would like to share with us?

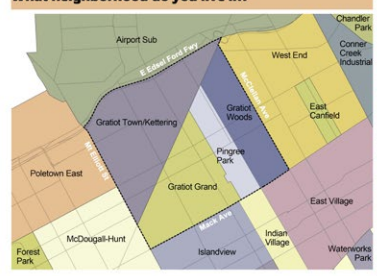
\_\_\_\_\_



# APPENDIX G: PROMOTIONAL MATERIALS

**VACANT LAND ADAPTATION VISUAL PREFERENCE SURVEY** 

**What neighborhood do you live in?**



**Please rate the extent to which you believe the following land uses would be beneficial in your neighborhood**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Natural Open Space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban agriculture (farms, orchards, community gardens, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Athletic/recreation spaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Gathering Space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playgrounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public art/humanities (murals, sculptures, communal library/book exchange, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land uses that manage stormwater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land uses that reduce air and noise pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trails/Greenways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**How important is revitalizing vacant lots in Kettering to you?**

I really don't want this


I would prefer this not happen

Doesn't matter to me either way

I would prefer this happen


I really want this to happen

**For the land uses above, please tell us your top 4 choices.**




## DETROIT GREENPRINT



**VACANT LAND ADAPTATION VISUAL PREFERENCE SURVEY** 

**What kind of natural open space do you prefer? (Select all that apply)**

Urban forests  Mowed Lawns  Prairies & Meadows

**What would you like to see in a community garden? (Select all that apply)**

Food-growing  Flowers  Seating

Urban beekeeping  Greenhouses  Community art

**What kind of green stormwater infrastructure do you prefer? (Select all that apply)**

Rain gardens  Bioswales  Bioretention basins

**What kind of social gathering space do you prefer? (Select all that apply)**

Picnic/Grill Area  Paved Seating Area  Amphitheater/Event Space

Flea markets  Shade Structure  Dog park

**Which of these play elements do you prefer? (Select all that apply)**

Traditional  Natural  Innovative

Grass Mounds  Water Play

**Is there any other information you would like to share with us?**

### Who are we ? What are we doing ?

We are six landscape architecture, environmental justice, and urban planning graduate students from the University of Michigan.

We are engaging with community residents and stakeholders to understand community needs and desires which will inform a greenprint (design plan) for vacant lots in Kettering. This project hopes to provide a framework and function as a pilot initiative for how to navigate the environmental effects of climate change within the context of Detroit communities.

For more information, please visit <https://sites.google.com/u-mich.edu/greenprintdet>

Social Media Accounts:  
Instagram @gp\_detroit  
Official Website

If you live in or near the Kettering neighborhood,

If you're interested in our project,



Please contact us at:  
Email: [greenprintdet@umich.edu](mailto:greenprintdet@umich.edu)



## APPENDIX H: LITERATURE CITED

“Detroit, Michigan.” *Flood Factor*, floodfactor.com/city/detroit-michigan/2622000\_fsid.

“Community Garden Guide Season Extension - Hoop Houses.” *United States Department of Agriculture*, www.nrcs.usda.gov/Internet/FSE\_PLANTMATERIALS/publications/mipmcar9802.pdf.

“Community Rating System.” *Federal Emergency Management Agency*, www.fema.gov/floodplain-management/community-rating-system.

“EPA Facility Stormwater Management.” *US EPA*, 9 Feb. 2022, www.epa.gov/greeningepa/epa-facility-stormwater-management.

Expert Environmental Consulting. “What Is Stormwater Management and Why Is It Important?” *Expert Environmental Consulting*, eecenvironmental.com/what-is-stormwater-management.

“Fish Farms | Fish Farming Information and Resources | *Farms.Com*.” Farms.Com, m.farms.com/farming/fish-farms.aspx.

“Flood Solutions.” *Flood Factor*, floodfactor.com/solutions.

“Greenhouse | Definition, Types, and Uses.” *Encyclopedia Britannica*, www.britannica.com/topic/greenhouse.

Gregg, Kelly, et al. “Foundations for Community Climate Action: Defining Climate Change Vulnerability in Detroit.” *Detroiters Working for Environmental Justice*, Dec. 2012, detroitenvironmentaljustice.org/wp-content/uploads/2017/10/SmClimate-Change-Vulnerability-Detroit-Report-1.pdf.

“Heat in the Heartland: Climate Change and Economic Risk in the Midwest – Risky Business.” *Climate Change and Economic Risk in the Midwest*, riskybusiness.org/report/heat-in-the-heartland-climate-change-and-economic-risk-in-the-midwest.

“List of Recommended Trees for The City of Detroit.” *The Greening of Detroit*, Oct. 2019, static1.squarespace.com/static/587e242ad1758eda63647b14/t/5eaad90ec4564828141ce1b5/1588254994109/2019+Detroit\_TreeSpecies\_Recommended\_Oct28.pdf.

*Low Impact Development: A Design Manual for Urban Areas*. University of Arkansas Press, 2022.

“Native Plants.” *Audubon*, www.audubon.org/native-plants/search?zipcode=48214&active\_tab=best\_results&attribute=&attribute\_tier1=&resource=&resource\_tier1=&bird\_type=&bird\_type\_tier1=&page=1&page\_tier1=1.

North, Darren. “What Is Aquaponics and How Does It Work?” *The Permaculture Research Institute*, 30 May 2016, www.permaculturenews.org/2016/05/30/what-is-aquaponics-and-how-does-it-work.

“Part 60 -- Criteria for Land Management and Use.” *Code of Federal Regulations*, www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-60.

“Participate in Buyouts and Acquisition Programs.” *Flood Factor*, help.floodfactor.com/hc/en-us/articles/360050891613--Participate-in-buyouts-and-acquisition-programs-.

“Plot Plan, Site Design, and Maintenance Guide.” *City of Detroit*, detroitmi.gov/sites/detroitmi.localhost/files/2021-03/Package\_3pt5\_REVDEC20.pdf.

“Prepare Your Community for a Flood Emergency.” *Flood Factor*, help.floodfactor.com/hc/en-us/articles/360050401554-Prepare-your-community-for-a-flood-emergency.

“Projected Mid-Century Temperature Changes in the Midwest.” *GlobalChange.Gov*, 2014, www.globalchange.gov/browse/multimedia/projected-mid-century-temperature-changes-midwest.

“Reducing Urban Heat Islands: Compendium of Strategies Cool Pavements.” *Environmental Protection Agency*, 2012, www.epa.gov/sites/default/files/2017-05/documents/reducing\_urban\_heat\_islands\_ch\_5.pdf.

“Reducing Urban Heat Islands: Compendium of Strategies Cool Roofs.” *Employee Assistance Program*, May 2017, www.epa.gov/sites/default/files/2017-05/documents/reducing\_urban\_heat\_islands\_ch\_4.pdf.

“Reducing Urban Heat Islands: Compendium of Strategies Trees and Vegetation.” *Employee Assistance Program*, June 2014, www.epa.gov/sites/default/files/2014-06/documents/treesandvegcompendium.pdf.

Southeast Michigan Council of Governments Information Center. “Low Impact Development Manual for Michigan.” *Southeast Michigan Council of Governments Information Center*, 2008, semcog.org/desktopmodules/SEMCOG.Publications/GetFile.ashx?filename=LowImpactDevelopmentManualforMichiganSeptember2008.pdf.

Staff, Asla. “Urban Trees: Strategies for Reducing Urban Heat Island in Cities.” *The Field*, 3 Aug. 2021, thefield.asla.org/2021/07/22/urban-trees-strategies-for-reducing-urban-heat-island-in-cities.

“Stormwater Flow Controls.” *Contech Engineered Solutions*, www.conteches.com/stormwater-management/stormwater-flow-controls.

“Take Action to Reduce Flood Risk with the Community Rating System.” *Flood Factor*, help.floodfactor.com/hc/en-us/articles/360048495994-Take-action-to-reduce-flood-risk-with-the-Community-Rating-System-CRS-. Accessed 12 Mar. 2022.

The Stormwater Blog. “What’s the Difference between Detention and Retention?” *Contech Engineered Solutions*, 4 June 2020, www.conteches.com/stormwater-article/article/207/what-s-the-difference-between-detention-and-retention.

United Nations. “What Is Climate Change?” *United Nations*, www.un.org/en/climatechange/what-is-climate-change.

Wang, Chenghao, et al. “Cool Pavements for Urban Heat Island Mitigation: A Synthetic Review.” *Renewable and Sustainable Energy Reviews*, vol. 146, 2021, p. 111171. Crossref, https://doi.org/10.1016/j.rser.2021.111171.

Weaver, Gabe. “Stormwater Infiltration Explained.” *Contech Engineered Solutions*, 18 Aug. 2014, www.conteches.com/stormwater-article/article/77/stormwater-infiltration-explained.

“What Exactly Is Hydroponics.” *GreenCoast Hydroponics*, www.gchydro.com/info/what-exactly-is-hydroponics.

THANK YOU

---