

# **DESIGN AND PLANNING FOR URBAN AGRICULTURE:** *The Role of Site Design in Supporting Community Spaces and Farming*



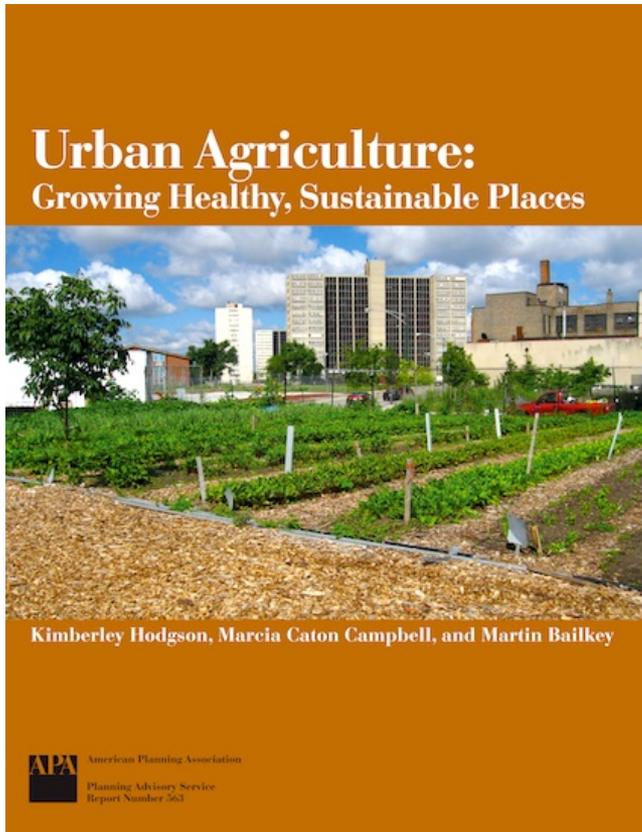
*Image Sources: "Carrot City" by M. Gorgolewski, SWA Group, & C. Napawan*

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Image Sources: "Carrot City" by M. Gorgolewski, SWA Group, & C. Napawan

# AMERICAN PLANNING ASSOCIATION LISTED BENEFITS ASSOCIATED WITH URAN AG



## *Health benefits:*

1. Increase accessibility to fruits & vegetables
2. Provide opportunities for public health programming
3. Therapeutic benefits of recreational gardening
4. Food security

## *Social benefits:*

1. Opportunity for community involvement
2. Social interaction between ethnically and age-diverse communities
3. Connection between farmers and consumers
4. Community economic security
5. Vacant property reuse strategy and catalyst for community development

## *Economic benefits:*

1. Provides volunteer maintenance
2. Increase local employment opportunity or training
3. Generates income
4. Capitalizes on underused resources
5. Increases property values
6. Reduces food expenditures to free larger portion of household income

## *Environmental benefits:*

1. Contribution to environmental management & productive reuse of contaminated land
2. Decreased storm-water run-off
3. Improved air quality
4. Increase urban biodiversity & species preservation



*Free Farm in San Francisco, Image by C. Napawan*



*Image source: Hungry City by C. Steel*



*Image source: Carl Steinitz*



*Image courtesy of the Boston Historical Society*



*Image source: "Manhatta" by E. Sanderson*

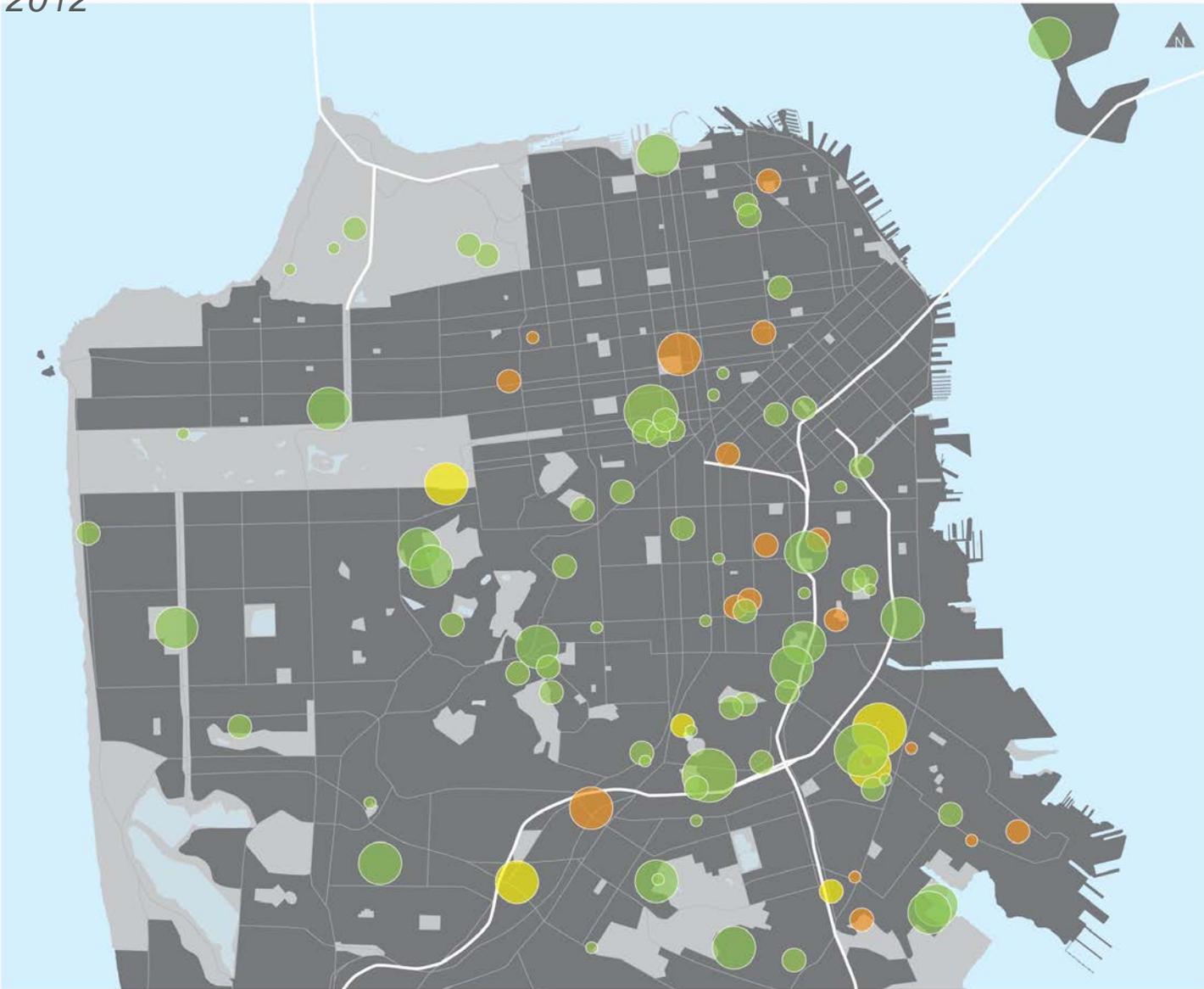


Copyright by E. H. Westman.

#### ON HISTORIC GROUND

Boston Common was credited with having one of the finest demonstration war gardens in the United States in 1918. This shows the quarter-acre section given over to potatoes, with Girl Scouts assisting in the cultivation. The gardens were planted by the Women's City Club, with experts on hand to give instruction and advice to visitors.

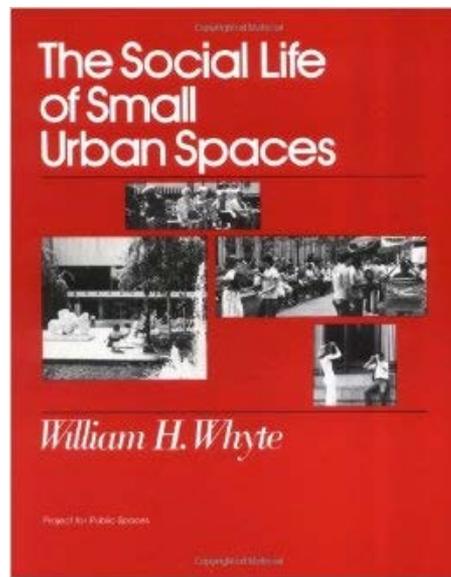
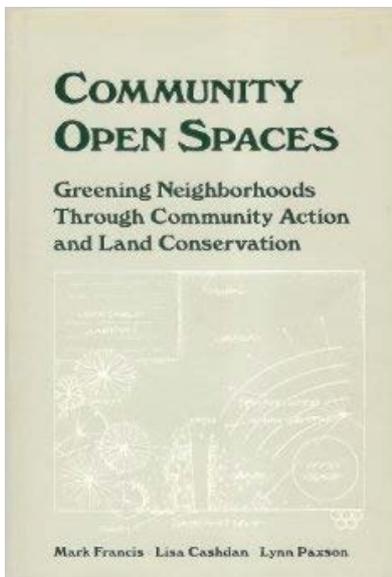
# URBAN AGRICULTURE PROJECTS IN SAN FRANCISCO, AS OF 2012



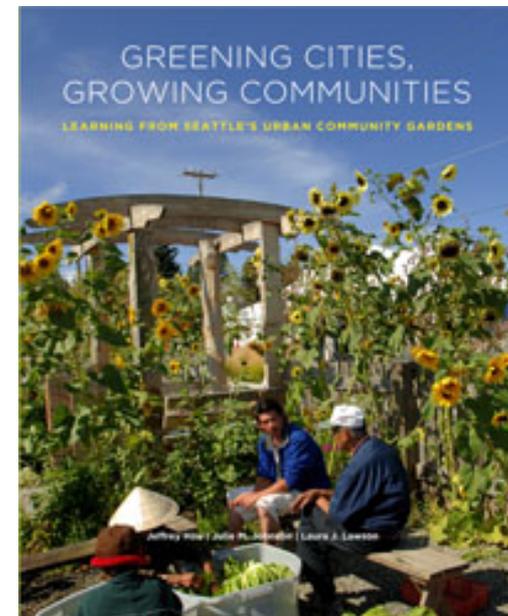
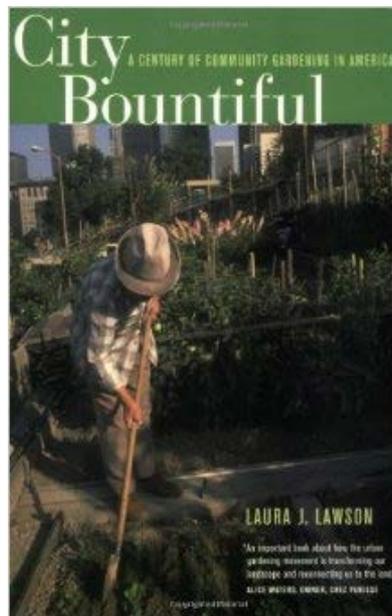
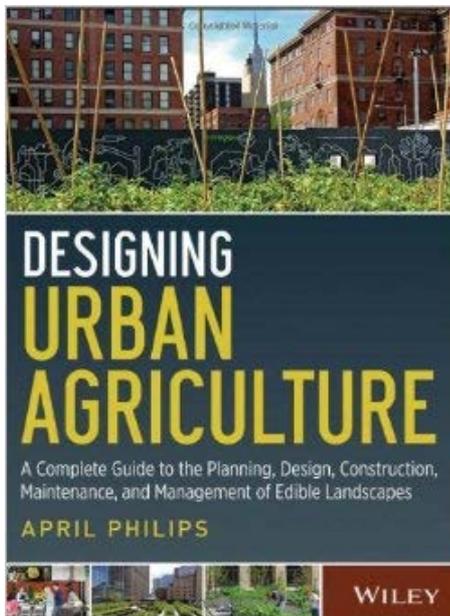
- Public Land (non-school) *existing* locations
- Public Land (non-school) *pending* locations
- Private Land *existing* locations

- <1,500 square feet (<0.03 acres)
- 1,500–10,000 square feet (0.03–0.25 acres)
- 10,000–50,000 square feet (0.25–1.15 acres)
- >50,000 square feet (>1.15 acres)

Image Source: San Francisco Planning and Urban Research



*EXISTING LITERATURE ON DESIGNING PUBLIC OPEN SPACE*



*EXISTING LITERATURE ON DESIGNING URBAN AGRICULTURE*

# LITERATURE REVIEW OF SPATIAL CONSIDERATIONS FOR SUCCESSFUL PUBLIC SPACE

Sources: *Spatial Considerations for successful urban public space:*

Marcus, C. (1976). "Mini Parks" in <i>People Places</i>	site selection with ease of pedestrian access and visibility; appropriate programming which includes community involvement; clear entrances and boundaries; and appropriate site materials use
Whyte, W. (1980). <i>The Social Life of Small Urban Spaces</i>	varied and abundant seating opportunities, the presence of water feature and/or food vending, a sense of enclosure, and proximity to active pedestrian corridors
Francis, M., Cashdon, L., Paxson, L. (1984). <i>Community Open Spaces</i>	site selection and programming relevant to neighborhood context; clear signage and integration with community on site development; site design may employ design professionals, but community input and volunteer efforts play a role in design and construction, and design has adaptability; community responsible for site maintenance and management
Project for Public Space (2000). "What Makes a Successful Place?"	sites are accessible; many and diverse users on site engaged in a range of activities; site is comfortable and has good image; site is a sociable place
Francis, M. (2003). <i>Urban Open Spaces</i>	site supports user needs & user diversity, program diversity, safety/security, and accessibility

# LITERATURE REVIEW ON SPATIAL CONSIDERATIONS FOR SUCCESSFUL UA PROJECTS

<i>Sources:</i>	<i>Spatial considerations for successful urban agriculture projects:</i>
Lawson, L. (2005). <i>City Bountiful</i>	design to engage a broader range of public participation, including youth and non-gardening/farming programs
Hou, J., Johnson, J., Lawson, L. (2009). <i>Greening Cities, Growing Communities</i>	ability for incremental change, adjustments, and improvements over time; sensitivity to existing context and user needs; multi-use, including non-gardening programs; diversity and artistic expression
Milburn, L. and Vail, B. (2010) "Sowing the Seeds of Success" from <i>Landscape Journal</i>	site selection/proximity to users, physical characteristics that support growing (solar gain, access to water & soil), compact site (as opposed to long, linear sites), high visibility from street and within garden, accessibility, inclusion of appropriate site elements for growing (including composting, storage, perimeter fencing, and bulletin/message board)

# SPATIAL CONSIDERATIONS FOR SUCCESSFUL A PRODUCTIVE PLACE



*Image source: C. Napawan*

## 1. *Context:*

C1. Appropriate location: neighborhood context

C2. Accessibility to site: pedestrian or transit

## 2. *Perimeter*

P1. Physical connectivity: ease of site entry

P2. Visual connectivity: ease of site entry

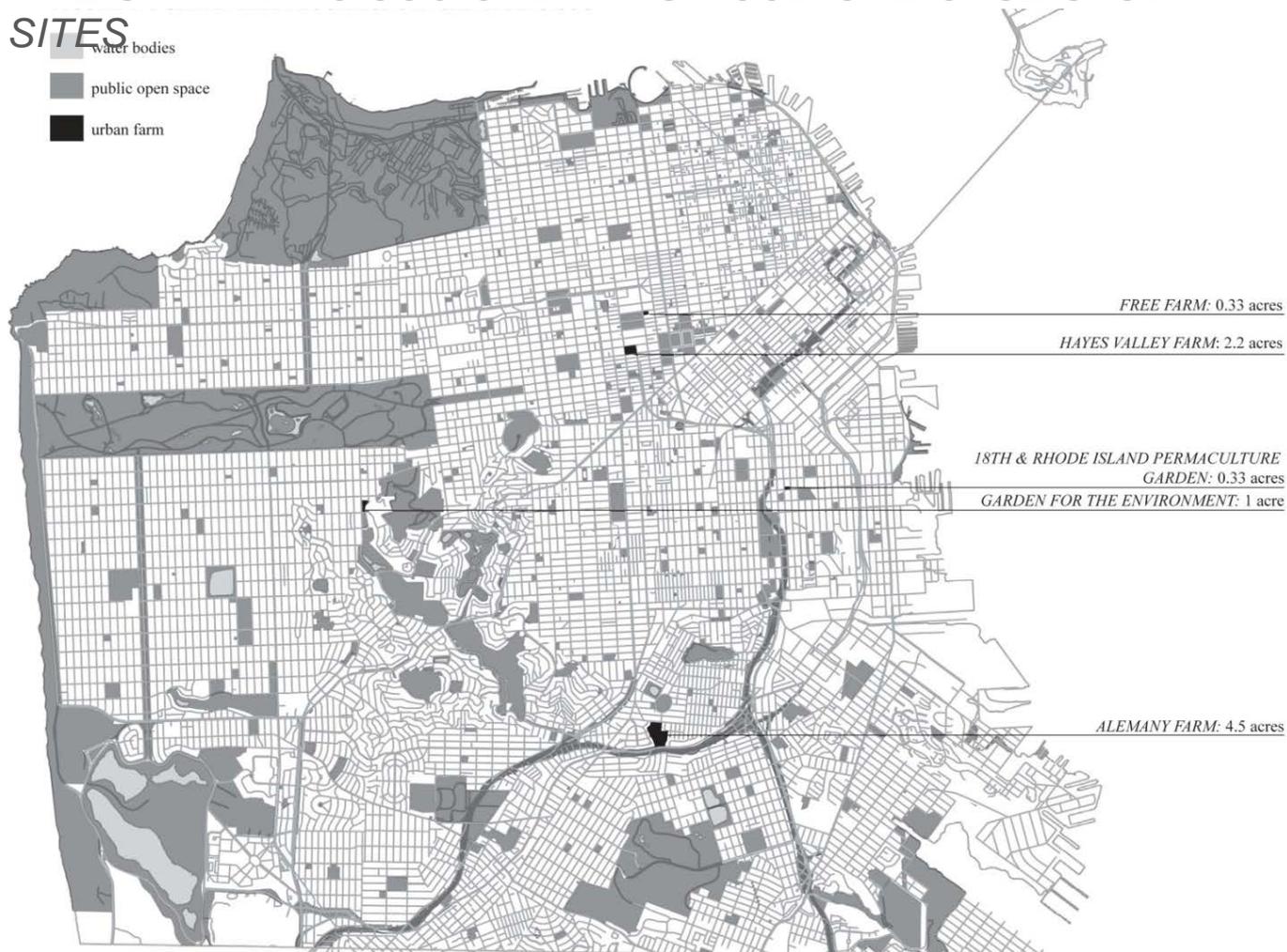
## 2. *Site Layout/Design*

S1. Flexible layout: accommodates multiple programs

S2. Accessibility within the site

S3. Site maintenance

# FIVE SAN FRANCISCO URBAN AGRICULTURE CASE STUDY SITES



FARM NAME:	SIZE:	DATE EST.:	LOCATION:	LAND TENURE:	MANAGEMENT:
<i>18<sup>TH</sup> &amp; RHODE ISLAND PERMACULTURE GARDEN</i>	0.33 acres	2008	18 <sup>th</sup> Street at Rhode Island Street, Portrero Hill neighborhood	privately owned by neighboring resident	non-profit organization
<i>ALEMANY FARM</i>	4.5 acres	1994	700 Alemany Boulevard , Bernal Heights neighborhood	San Francisco Department of Recreation & Parks (SFDRP)	volunteer group: <i>Friends of Alemany Farm</i>
<i>FREE FARM</i>	0.33 acres	2010	Gough Street at Eddy Street, Western Addition neighborhood	privately owned by St. Paulus Church	several non-profit organizations
<i>GARDEN FOR THE ENVIRONMENT</i>	1 acre	1990	7 <sup>th</sup> Avenue at Lawton Street, Inner Sunset neighborhood	San Francisco Public Utilities Commission (SFPUC)	non-profit organization
<i>HAYES VALLEY FARM</i>	2.2 acres	2010	450 Laguna Street at Fell Street, Hayes Valley neighborhood	city-owned	non-profit organization

# FIVE SAN FRANCISCO URBAN AGRICULTURE CASE STUDY SITES



18<sup>th</sup> & Rhode Island Permaculture Garden



Alemany Farm



The Free Farm



Garden for the Environment



Hayes Valley Farm

*Image source: C. Napawan*



18<sup>th</sup> & Rhode Island Garden



Alemaný Farm



Free Farm



Garden for the Environment



Hayes Valley Farm

# FIVE SAN FRANCISCO URBAN AGRICULTURE CASE STUDY SITES

18th & Rhode Island  
Permaculture Garden

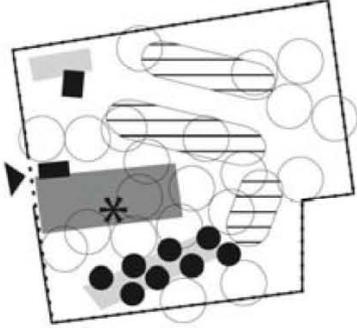
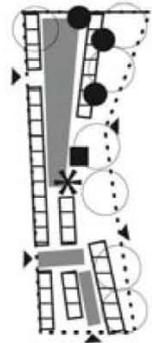
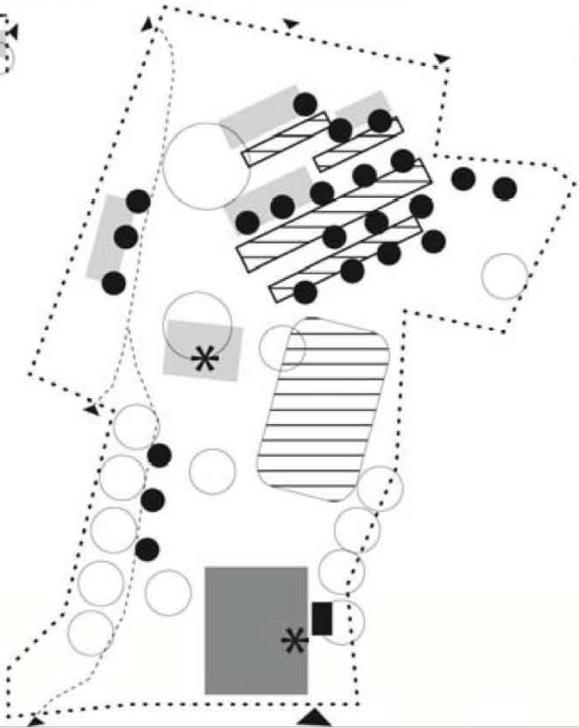
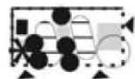
Alemanly Farm

Free Farm

Garden for the Environment

Hayes Valley Farm

Legend



- canopy tree
- fruit trees
- \* activity hub
- program space
- accessible program space
- ▨ row crops
- ▨ raised beds
- ▶ major entry (car access)
- minor entry
- structures
- wall/fence
- trails
- ..... property limit

North ↑

Alemanly Farm

18th & Rhode Island  
Permaculture Garden

Free Farm

Garden for the Environment

Hayes Valley Farm



North ↑

Image source: C. Napawan

# SPATIAL CONSIDERATIONS FOR SUCCESSFUL A PRODUCTIVE PLACE



Image source: C. Napawan

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## PERIMETER TREATMENT AS GREATEST INDICATOR OF DESIGN SUCCESS

18th & Rhode Island  
Permaculture Garden



Aleman Farm



Free Farm



Garden for the  
Environment



Hayes Valley Farm



*Image source: C. Napawan*

If we redefine a successful urban agriculture to include its integration with community (and not merely productive output) the visual and physical accessibility of a site becomes the most significant design consideration.



*Image Sources: "Carrot City" by M. Gorgolewski*

## *DESIGN AND PLANNING OF URBAN AGRICULTURE*

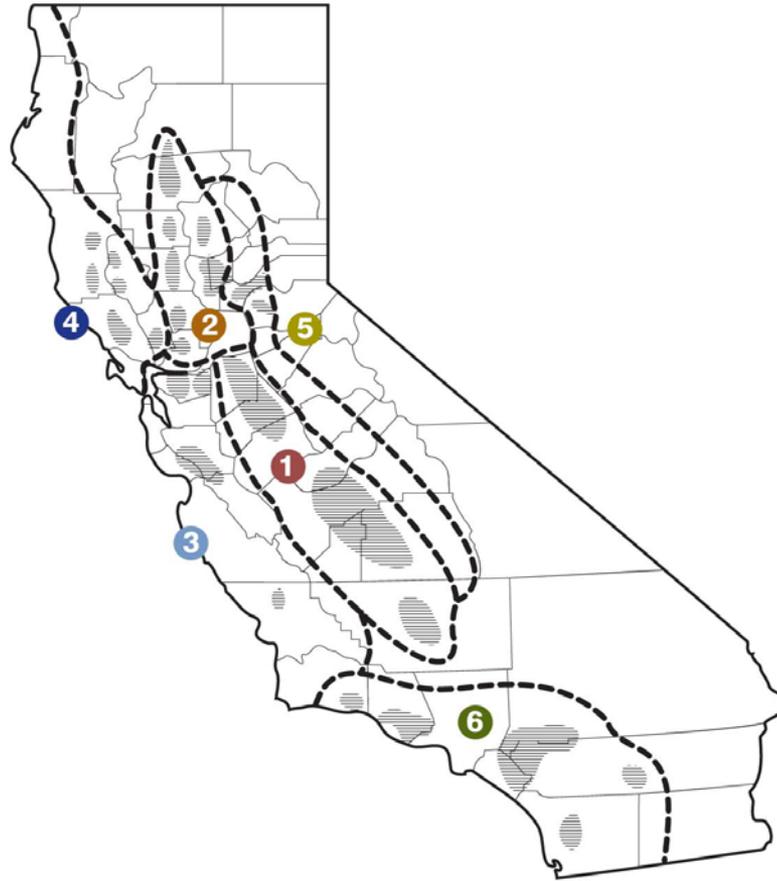
### *SITE ANALYSIS:*

- **SITE ASSESSMENT:** analyzing physical attributes such as site location & adjacencies; growing region, climate, & microclimate; and resource availability such as water, soil, and solar energy.
- **COMUNITY/USER ASSESSMENT:** understanding the needs/desires, the existing or intended patterns of use, and the maintenance capabilities of the client/users.
- **PROGRAMMATIC ASSESSMENT:** recognizing the functions attributed to the landscape other than food-growing.

### *PLACE-MAKING:*

- Synthesizing urban farm forms with site analysis to accommodate farming and non-farming functions

## SITE ASSESSMENT: REGIONAL SCALE



*Image Source: Adapted from Vossen, 2002*

# SITE ASSESSMENT: SITE SCALE

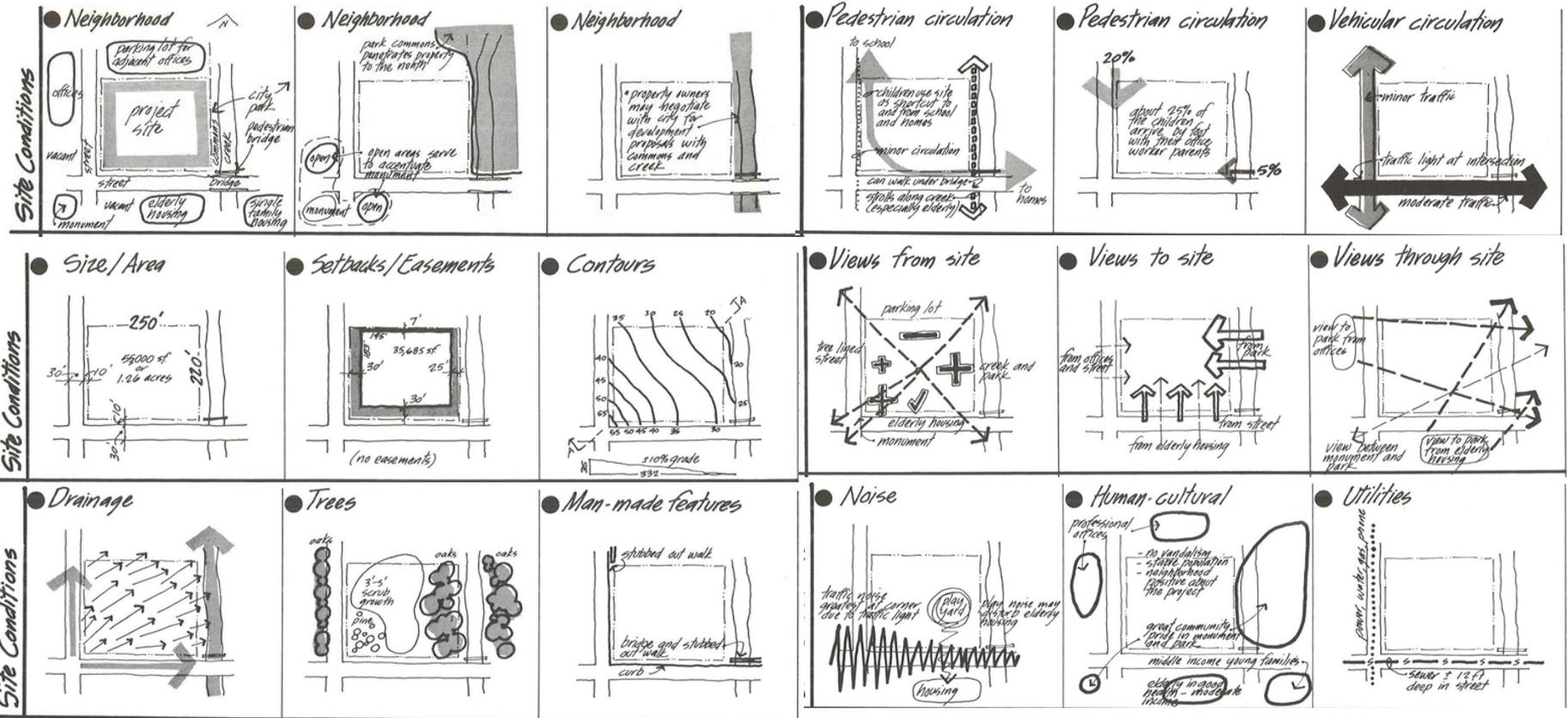
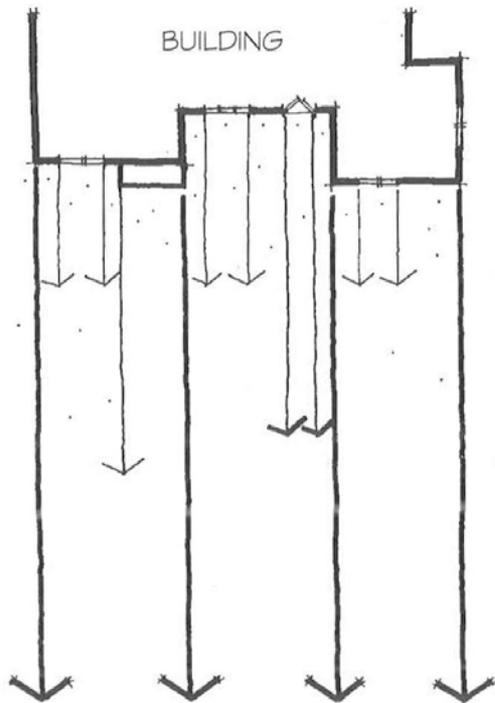


Image source: "Site Analysis" by E. T. White

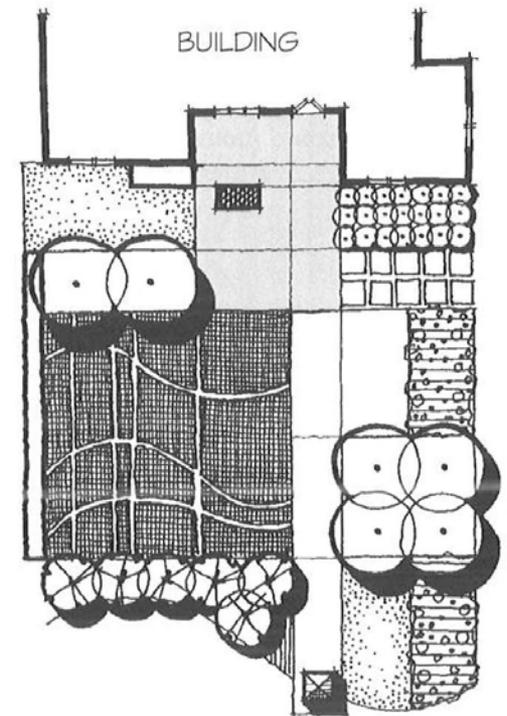
## SITE ASSESSMENT: EXISTING OR PROPOSED STRUCTURES?



LINES EXTENDED INTO SITE from  
PROMINENT BUILDING FEATURES



GRID BASED ON ADJOINING  
BUILDING



SITE PLAN BASED ON GRID

Image source: *"Form and Fabric in Landscape Architecture,"* by C. Dee



*Image Sources: "Carrot City" by M. Gorgolewski*

## **SITE ASSESSMENT: RESOURCE AVAILABILITY**

- Soil – Identify if adequate soil exists on-site; confirm safety of soils for edible plants by soil testing, if located in potentially contaminated site; identify appropriate plants for soil type & condition (soil amendments discussed in forthcoming section).
- Water – Identify availability of water on-site; confirm average volumes of available water; identify appropriate edible plants for water availability; determine appropriate irrigation method for water availability & desired plants (irrigation techniques & water policies discussed in forthcoming sections).
- Solar Energy – Evaluate the site's cardinal orientation and immediate adjacencies; identify appropriate plants for solar conditions present; for more detailed information on sun/shade studies:  
<http://www.idsketching.com/basic/toolbox-shadows/>

## SITE ASSESSMENT: SOLAR AVAILABILITY

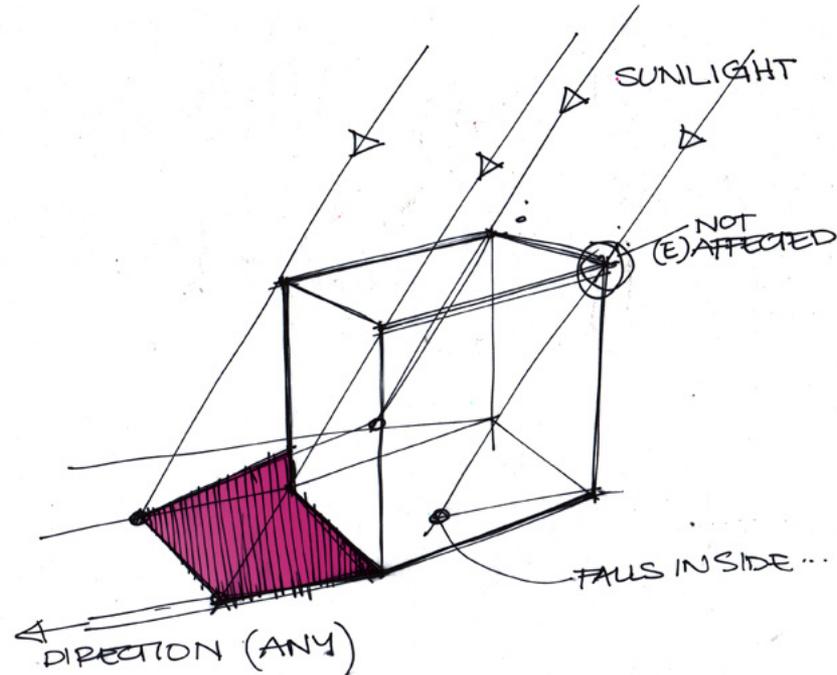


Image source: <http://www.idsketching.com/basic/toolbox-shadows/>

- <http://www.nrel.gov/midc/solpos/solpos.html>
- <http://aa.usno.navy.mil/data/docs/AltAz.php>

# SITE ASSESSMENT: COMMUNITY/USER ASSESSMENT



Image source: <https://ww2.kqed.org/bayareabites/2015/09/14/urban-adamah-to-break-ground-on-new-farm-in-west-berkeley/>



*Image source: "Beverly Pepper" from Spacemaker Press (ed)*

## *PROGRAMMATIC ASSESSMENT: NON-FARMING COMPONENTS*

*Active Recreation*

*Outdoor Films*

*Fire pits*

*Gathering of multiple group sizes*

*Playscapes*

*Diverse seating options*

*Non-agricultural gardening*

*Outdoor Classroom*

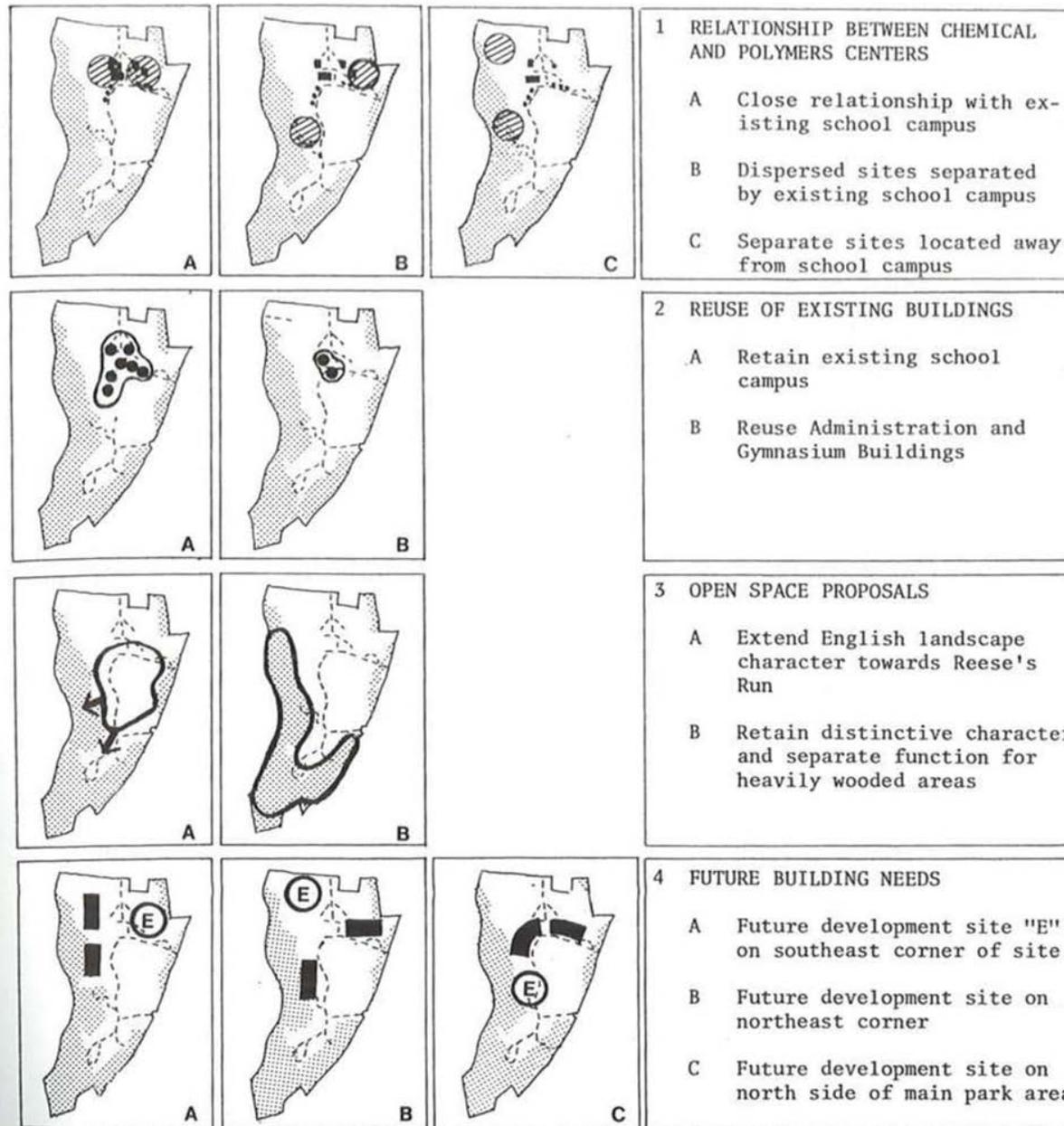
*Accessible circulation (ADA)*

*Dog Run*

*Outdoor kitchens*

*Outdoor dining/picnicking*

# SITE ASSESSMENT: SYNTHESIS & ALTERNATIVES





# URBAN AGRICULTURE LANDSCAPE COMPONENTS



## ROW CROPS

ROWS OF MONO- OR POLY-CULTURAL EDIBLE PLANT TYPES & COMPANION PLANTS, PLANTED IN-GROUND IN LONG ROWS TO FACILITATE ACCESS FOR WATERING, WEEDING, AND HARVESTING



## RAISED PLANTERS

ROWS OF MONO- OR POLY-CULTURAL EDIBLE PLANT TYPES & COMPANION PLANTS, PLANTED ABOVE GROUND IN CONTAINERS, TYPICALLY TO ADDRESS EXISTING SOIL CONDITIONS, TOPOGRAPHY OR TO FACILITATE ACCESS FOR WATERING, WEEDING, AND HARVESTING



## GROUNDCOVER & FIELDS

MONOCULTURE PLANTING OF EDIBLE PLANTS; EXAMPLES INCLUDE GRAIN FIELDS, STRAWBERRY PATCHES & OTHER GROUNDCOVERS



## VINEYARDS

CLIMBING EDIBLE PLANTS & VINES TRAINED TO GROWN ON WALLS, TRELLISES, OR FENCES; EXAMPLES INCLUDE GRAPEVINES & ESPALIER TREES



## ORCHARDS

FRUIT OR NUT BEARING TREES PLANTED IN FORMAL OR INFORMAL CLUSTERED ARRANGEMENTS; PLANTING VARIATIONS INCLUDE GRIDS, ALLEES, & QUINCUXES



## HEDGES & HEDGEROWS

MASSING OF 1 OR MORE EDIBLE PLANTS, OCCASIONALLY MULTI-SPECIES, TO CREATE A BARRIER WITHIN THE LANDSCAPE; EMPLOYED TO PROVIDE PHYSICAL BARRIERS, WIND BREAKS, OR SHADE



## GREENHOUSE

ENCLOSED STRUCTURE THAT ALLOWS SOLAR ENERGY TO RAISE INTERIOR TEMPERATURE IN ORDER TO GROW PLANTS IN SEMI-CONTROLLED CLIMATE



## ANIMAL ENCLOSURES

ENCLOSURES THAT HOUSE A RANGE OF FARMED ANIMALS OR ANIMALS BENEFICIAL TO FOOD PRODUCTION; EXAMPLES INCLUDE PENS, COOPS, AND BEE HIVES



## AQUACULTURE

RAISED OR IN-GROUND POOLS FOR RAISING FISH FOR CONSUMPTION, OCCASIONALLY WITH WETLAND PLANTINGS



## COMPOSTING

PLANT-BASED (INCLUDING PAPER) WASTE PRODUCTS; STORED IN PILES OR IN BINS TO INCREASE COMPOSITION SPEED, ROTATION REQUIRED; EVENTUALLY COMPOST IS APPLIED TO IMPROVE SOIL GROWING CAPACITY

Image source: C. Napawan

# PLACE-MAKING: USING PLANTS TO DEFINE SPACES & FUNCTIONS

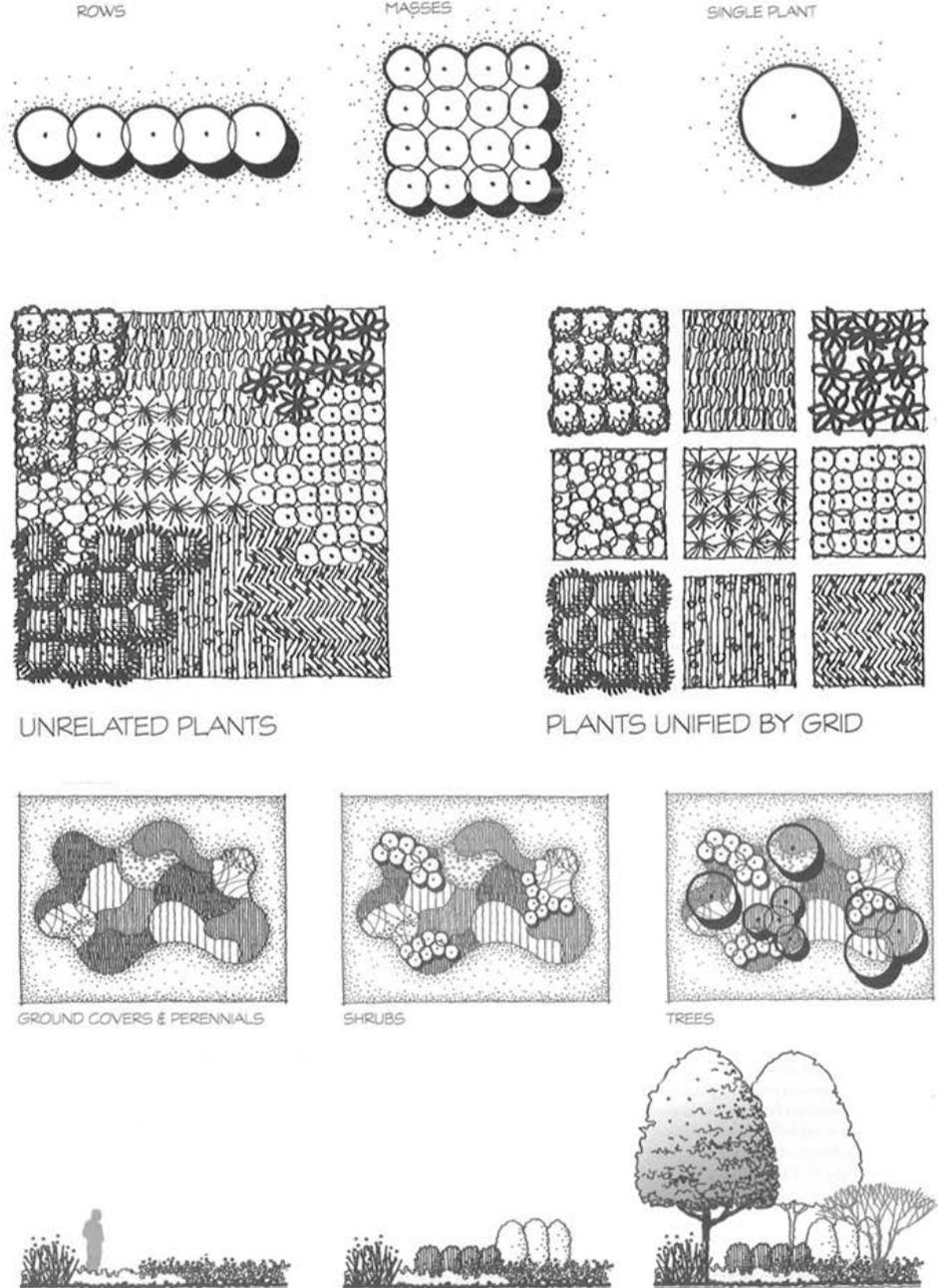


Image source: "Carrot City," by M. Gorgolewski. Image source: "Form and Fabric in Landscape Architecture," by C. Dee

*PLACEMAKING: EDIBLE PLANTS AS FORM-MAKING TOOLS*



*Containers*



*Hedges/Walls*



*Carpets*

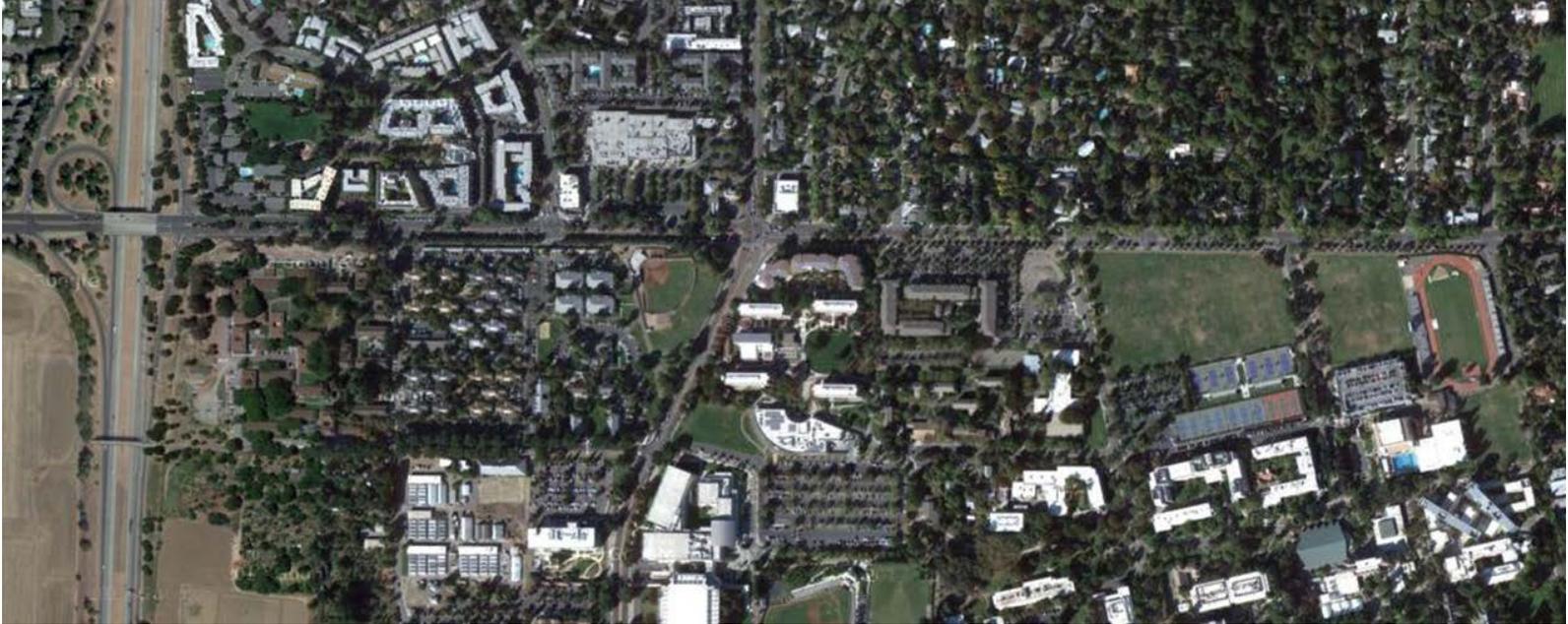


*Canopies/Columns*

*Image sources: C. Napawan*

# PLACE-MAKING: URBAN FARMS AS COMMUNITY SPACES





*Image sources: C. Napawan*

## *URBAN AGRICULTURE AS PUBLIC SPACE: CASE STUDY*

*Russel Boulevard streetscape, Davis, CA, managed by the UC Davis Olive*



Image Sources: "Carrot City" by M. Gorgolewski

## URBAN AGRICULTURE AS PUBLIC SPACE: CASE STUDY

Public Housing at Southwark, London, designed by Fritz Haeg



PLANTING STRATEGY

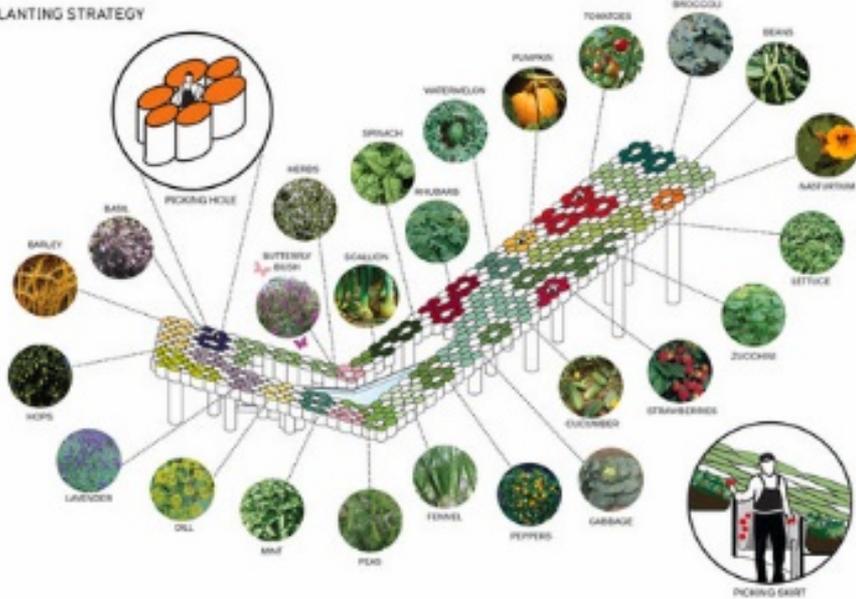


Image Sources: "Carrot City" by M. Gorgolewski

# URBAN AGRICULTURE AS PUBLIC SPACE: CASE STUDY

Public Farm 1 at P.S. 1 in Brooklyn, by WorkAC