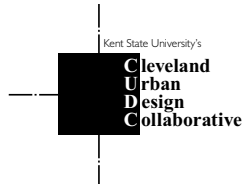




RE-IMAGINING CLEVELAND

VACANT LAND RE-USE PATTERN BOOK



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With support from

The Surdna Foundation
The Cleveland Foundation
The American Planning Association Urban Design and Preservation Division

April 2009

Front cover images by Bobbi Reichtell and Fran DiDonato; back cover images by Katherine Glantz Holmok, Bobbi Reichtell and Carl Skalak.

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Chapter 1 Introduction

This pattern book is a companion to the Reimagining Cleveland plan and recommendations for vacant land reuse that were adopted by the Cleveland City Planning Commission in December 2008. This book is intended to provide inspiration, guidance and resources for community groups and individuals who want to create productive benefit from vacant land in their neighborhood and begin to restore Cleveland’s ecosystem. There are ideas that you can use as a starting point for designing community spaces that are unique to your neighborhood’s personal interests, creativity and the appropriateness of the site. Through OhioGreenPrint.org you can gather data and map vacant land. As you research and plan for vacant land reuses in your neighborhood, be sure to look for patterns and opportunities for connections between them. You can begin to build a greenway network through your community and the city, incorporating community gardens, parks, trails, rain gardens and more. Many people are working to make Cleveland a Green City on a Blue Lake. Your smart reuse of vacant land in your neighborhood can be a huge contribution to this effort.

“Change will not come if we wait for some other person or some other time. We are the ones we’ve been waiting for. We are the change that we seek.”

President Barack Obama

Chapter 1

NEIGHBORHOOD CONNECTIONS



Neighborhood Pathway



- 1 flowering trees
- 2 gravel path
- 3 hedge row

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (3,360) \$5,040

landscape materials

topsoil \$25 per cubic yard (20) \$500

plant materials

6' flowering tree-flwg.plum \$200 ea. (12) \$2,400

4' upright shrub-viburnum, thuja \$80 ea. (80) \$6,400
(optional strategy for lining the walkway)

seed materials

low mow lawn \$0.12 s.f. (2,000) \$240

wildflowers \$0.50 s.f. (500) \$250

Neighborhood Pathway Total Cost Estimate

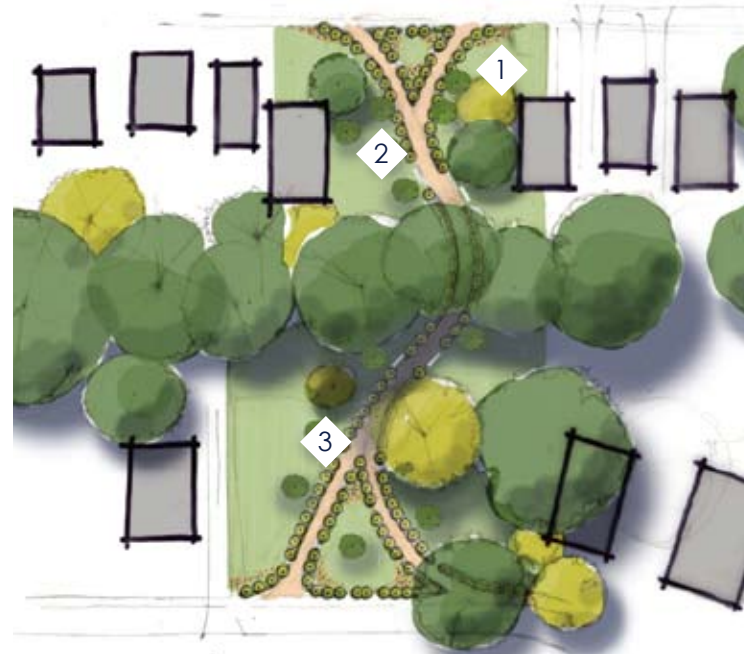
subtotal cost \$0.53 per square foot **\$15,330**

contingency 10% \$1,500

design/engineering 10% \$1,500

total project cost **\$18,330**

Cost Estimate Parcel Area 29,000 square feet (0.67 acre)



Neighborhood Pathway creates an opportunity to develop a parklike setting that functions as both a neighborhood amenity and a connection between two parallel streets. This pattern would prove to be of great use in areas where the blocks are very long reducing non-automobile travel time.

Thin Parcel Connection



- 1 crosswalk
- 2 fruit trees
- 3 gravel path
- 4 sidewalk

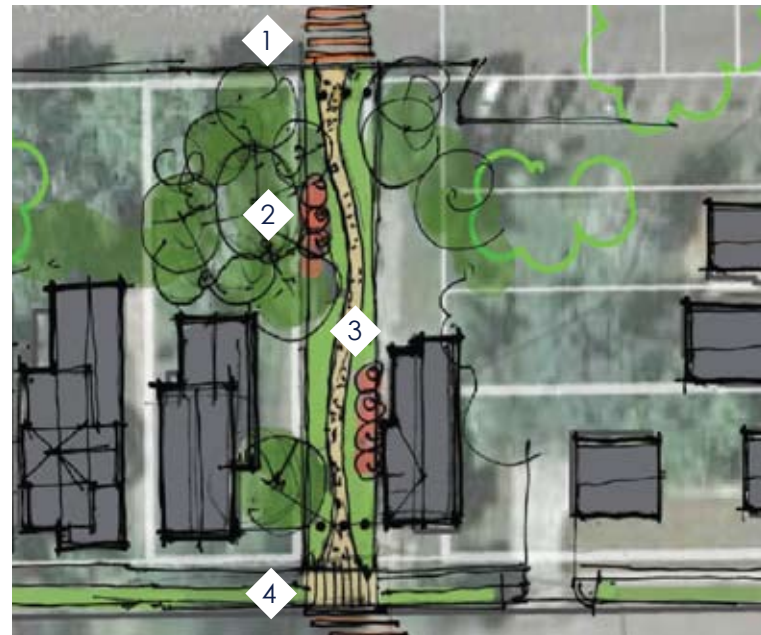
Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25)	\$500
walkway/paving materials	
compacted crushed gravel \$1.50 s.f. (1,040)	\$1,560
landscape materials	
topsoil \$25 per cubic yard (45)	\$1,125
plant materials	
6' flowering tree-flwg. plum \$200 ea. (10)	\$2,000
seed materials	
low mow lawn \$0.12 s.f. (1,060)	\$127
wildflowers \$0.50 s.f. (500)	\$250

Thin Parcel Connection Total Cost Estimate

subtotal cost \$3.18 per square foot	\$3,560
contingency 10%	\$360
design/engineering 10%	\$360
total project cost	\$4,280

Cost Estimate.....Parcel Area 1,120 square feet (0.02 acre)



Thin Parcel Connection creates an opportunity to connect two parallel streets and would offer a similar parklike setting found in the Neighborhood Pathway pattern. This pattern would likely serve as a permanent installation on a plot of land that will be difficult to develop due to its narrow dimensions.

Multiple Parcel Connection



- 1 crosswalk
- 2 fruit trees
- 3 event area
- 4 gathering

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (350)\$7,000

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (4,160)\$6,240

precast pervious paver \$15.00 s.f. (800)\$18,240

landscape materials

topsoil \$25 per cubic yard (30)\$750

planting mixture \$45 per cubic yard (100)\$4,500

mulch \$40 per cubic yard (5)\$200

plant materials

6' flowering tree-flwg.plum \$200 ea. (12)\$2,400

4' upright shrub-viburnum, thuja \$80 ea. (80)\$6,400

3' spreading shrub-dogwood,rose \$50 ea. (25)\$1,350

grasses-perennials \$5 s.f. (500)\$2,500

seed materials

low mow lawn \$0.12 s.f. (4,000)\$480

furnishings

waste receptacles \$600 ea. (3)\$1,800

5' stone seat walls \$500 ea. (3)\$1,500

fencing

4' ornamental metal \$50 l.f. (100)\$5,000

post treatment \$75 ea. (4)\$300

Multiple Parcel Connection Total Cost Estimate

subtotal cost \$3.94 per square foot.....**\$53,540**

contingency 10%\$5,550

design/engineering 10%\$5,550

total project cost**\$64,640**

Cost Estimate.....Parcel Area 13,600 square feet (0.31 acre)



Multiple Parcel Connection is an elaboration on the Thin Parcel Connection pattern. Where applicable, It would serve to create more of a pathway network connecting multiple streets while offering the opportunity to create a parklike setting with a series of amenities useful to both private residents as well as to the general public.

Street Edge Improvement



- 1 low-mow groundcover stripes
- 2 flowering trees
- 3 gravel path
- 4 street trees

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (3,500) \$5,250

landscape materials

topsoil \$25 per cubic yard (25) \$625

plant materials

8' evergreen-spruce, fir \$250 ea. (6) \$1,500

6' flowering tree-flwg. plum \$200 ea. (12) \$2,400

grasses-perennials \$5 s.f. (1,200) \$6,000

seed materials

low mow lawn \$0.12 s.f. (18,000) \$2,160

wildflowers \$0.50 s.f. (500) \$250

furnishings

waste receptacle \$600 ea. (1) \$600

Street Edge Improvement Total Cost Estimate

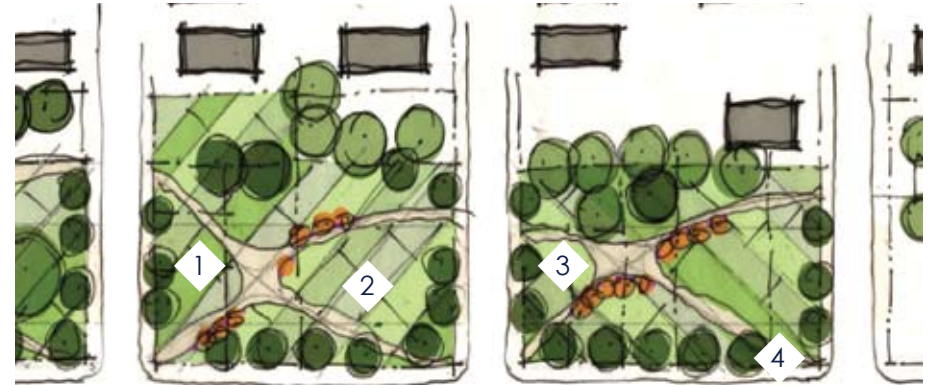
subtotal cost \$0.79 per square foot **\$19,035**

contingency 10% \$1,900

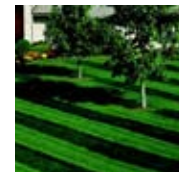
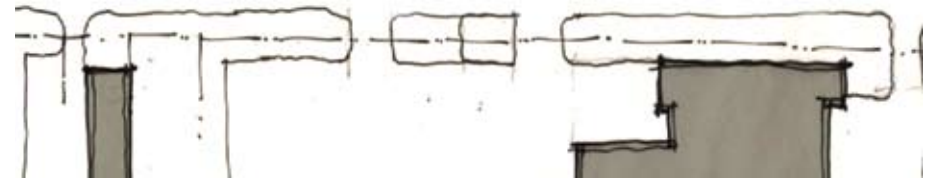
design/engineering 10% \$1,900

total project cost **\$22,835**

Cost Estimate.....Parcel Area 24,000 square feet (0.55 acre)



cost estimate 1 section 120'x200'



Street Edge Improvement is a low cost beautification strategy that creates public spaces, discourages illegal activities such as debris dumping and defines the street edge with orderly rows of trees that can remain if development occurs. This pattern would be most useful in areas where development may or may not occur for the foreseeable future.



Split Lot Greening

Per Unit Cost Estimates

legal fees for parcel split.....	\$1,500
soil, seed, and plant material.....	\$1,500
fencing.....	\$2,000

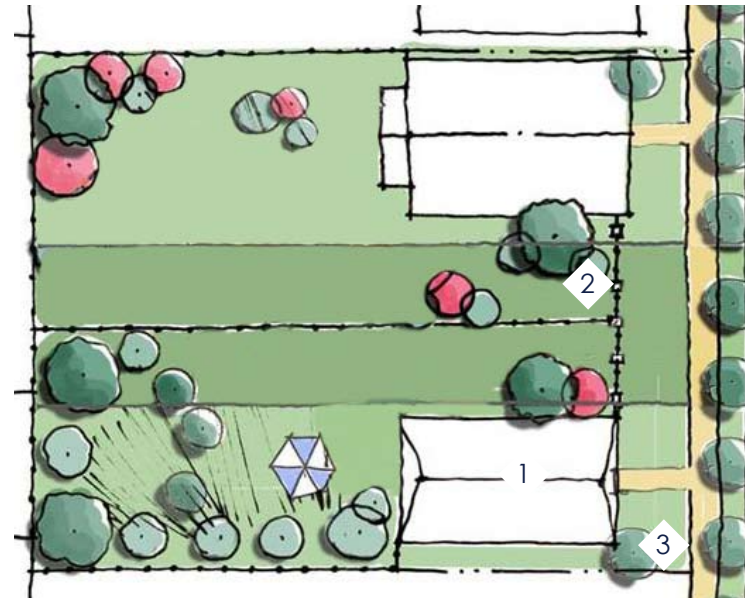
Split Lot Greening Total Cost Estimate

subtotal cost \$2.50 per square foot.....	\$5,000
contingency 5%.....	\$250
total project cost	\$5,250

Cost Estimate.....Parcel Area 2,000 square feet (0.05 acre)



- 1 lawn expansion
- 2 trees, shrubs
- 3 fence



A vacant lot can be split between two adjacent homeowners to allow for larger yards, expanded green space, and gardens. This strategy is appropriate when two homeowners adjacent to a vacant lot have the interest and resources to expand and maintain their properties. The simplest and least expensive strategy is to landscape each half of the lot as an extension of the adjacent property.

Split Lot Greening: garden & driveway



- 1 tree buffer
- 2 gravel path
- 3 patio
- 4 gardens

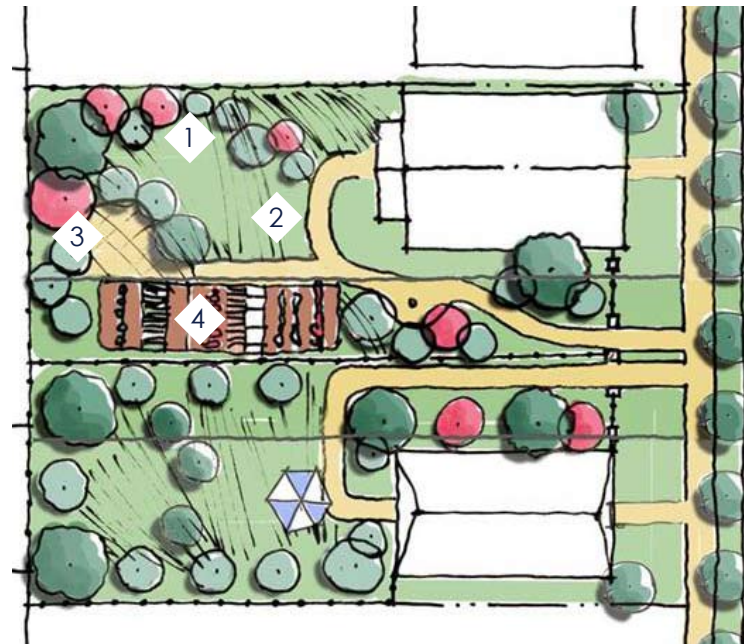
Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25)	\$500
walkway/paving materials	
compacted crushed gravel \$1.50 s.f. (1,500)	\$2,250
landscape materials	
planting mixture \$45 per cubic yard (20)	\$900
mulch \$40 per cubic yard (5)	\$200
nursery stock	
seed mix \$0.28 s.f. (500)	\$140
native plant seedlings 32 plug flats \$128 ea. (10)	\$1,280
plant materials	
8' evergreen-spruce, fir \$250 ea. (12)	\$3,000
6' flowering tree-flwg. plum \$200 ea. (12)	\$2,400
low mow seeding \$0.12 s.f. (3,000)	\$360
fencing	
4' wood frame/wire \$30 l.f. (300)	\$9,000
entry gate \$1,500 ea. (2)	\$3,000
furnishings	
rain barrels \$250 ea. (6)	\$1,500

Split Lot Greening Total Cost Estimate

subtotal cost \$6.13 per square foot	\$24,530
contingency 10%	\$2,450
design/engineering 10%	\$2,450
total project cost	\$29,430

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



Once a lot split has occurred, adjacent property owners can make further investments in their newly expanded properties, such as gardens, driveways, etc.

Pocket Park



- 1 seating
- 2 paving
- 3 fruit trees
- 4 gardens

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (1,500) \$2,250

precast pervious paver \$15.00 s.f. (300) \$4,500

landscape materials

topsoil \$25 per cubic yard (45) \$1,125

nursery stock

seed mix \$0.28 s.f. (500) \$140

native plant seedlings 32 plug flats \$128 ea. (10) \$1,280

plant materials

8' evergreen-spruce, fir \$250 ea. (12) \$3,000

6' flowering tree-flwg. plum \$200 ea. (3) \$600

low mow seeding \$0.12 s.f. (3,200) \$384

furnishings

waste receptacles \$600 ea. (1) \$600

5' stone seat walls \$500 ea. (2) \$1,000

Pocket Park Total Cost Estimate

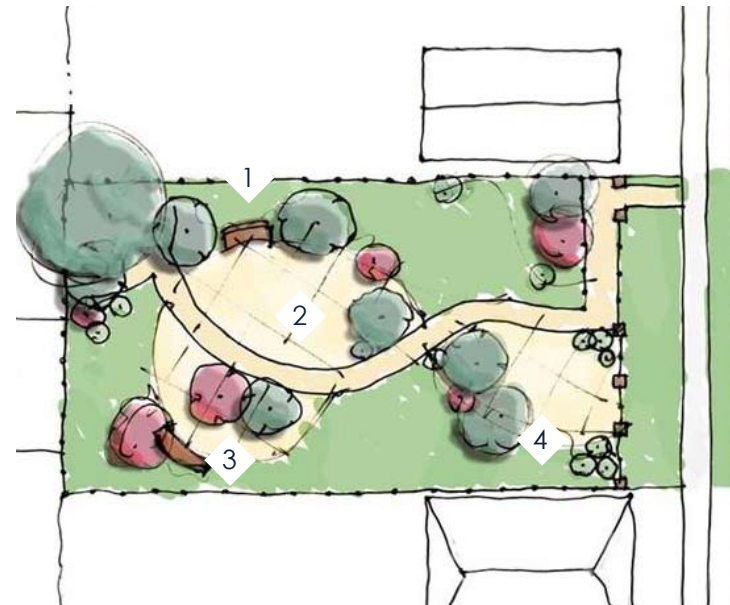
subtotal cost \$3.85 per square foot **\$15,379**

contingency 10% \$1,540

design/engineering 10% \$1,540

total project cost **\$18,459**

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



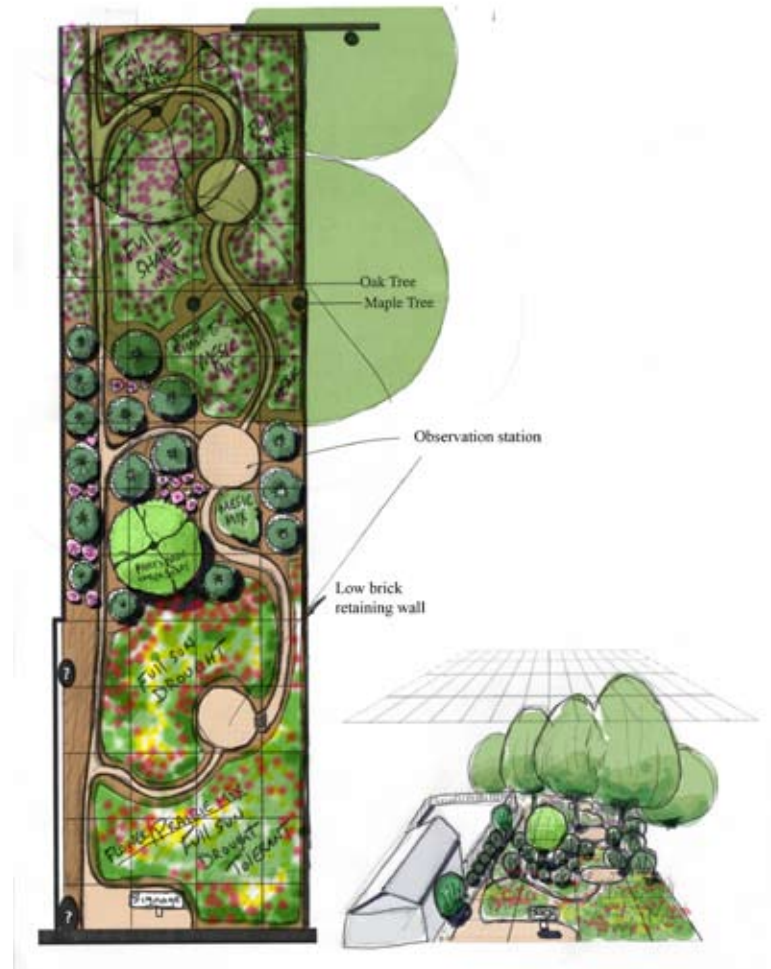
Vacant lots on residential streets can provide a community area for residents, as either a community garden or a passive green space with seating. The plants selected will need to thrive in the shade, especially if the lot is narrow and is framed by houses on either side. Stewardship is the key to making this strategy successful. A community development corporation, a block club, a church group, or an informal alliance of neighbors can assume responsibility for the upkeep of a pocket park. The side and rear edges of a pocket park should have fencing, hedges, or other screening to buffer adjacent homeowners from noise and activity in the park.

Native Planting Plan

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25)	\$500
sheet mulch.....	\$600
<i>Lay a layer of cardboard down over the entire lot. Cover with 2-4 inches topsoil (20 cubic yards). Cover with 4-6 inches straw, not hay, (40 cubic yards). Thoroughly soak with water. Let cure for 8 weeks.</i>	
broadcast native plants	\$500
<i>Ohio Prairie Nursery "True Colors Mesic by 18 Short"</i>	
labor for site preparation and initial planting.....	\$2,000
plant 5 trees (minimum) at \$250 per tree	\$1,250
<i>Plant any 5 of the following trees, keeping at least 5 feet between their 20 year crowns. The older the tree, the more likely it will establish successfully.</i>	
<ul style="list-style-type: none"> • Cercis canadensis - redbud • Cladrastis kentuckea - yellowwood • Quercus coccinea - scarlet oak • Liriodendron tulipifera - tuliptree/yellow poplar • Halesia caroliniana - silver bell • Juniperus communis - common juniper/red cedar • Thuja occidentalis - arborvitae • Carpinus caroliniana - hornbeam, musclemwood • Magnolia acuminata - cucumber magnolia • Acer pensylvanicum - Striped Maple • Asimina triloba - Pawpaw • Amelanchier laevis - Allegheny Serviceberry • Prunus serotina - Wild Black Cherry • Sassafras albidum - Sassafras • Prunus nigra - Canadian Plum • Corylus americana - American Hazelnut 	
total project cost	\$4,850

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



The EarthDay Coalition has developed recommendations for native plantings on vacant lots. Native landscapes can be established affordably using seed mixtures of grasses and perennials, along with trees and shrubs. Once established, native plant materials are hardy and low-maintenance. A native landscape offers local color and provides habitat for birds, butterflies, and other wildlife.

Gazebo/Park



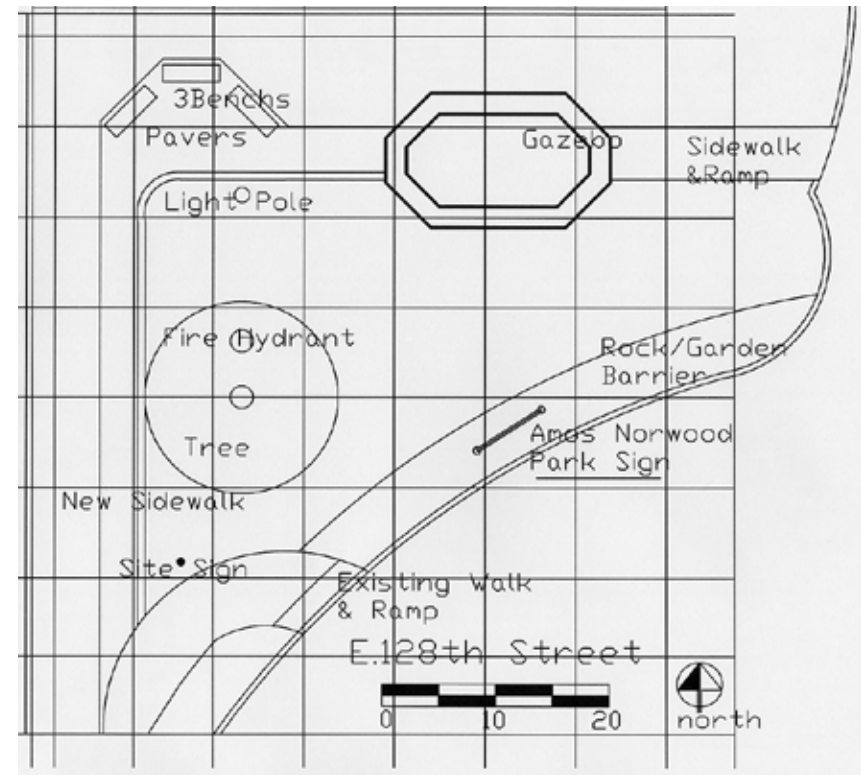
Per Unit Cost Estimates

Gazebo structure	\$10,000
landscape materials	
plants and planting mixture	\$5,000
site preparation and landscape installation	\$2,000
furnishings	
trash cans, benches	\$5,000
planter/barrier	\$2,500
fencing	
ornamental wrought iron-style fencing	\$2,000
paving	
concrete pad	\$5,000

Gazebo/Park Total Cost Estimate

subtotal cost \$5.25 per square foot	\$31,500
contingency 10%	\$3,150
design/engineering 10%	\$3,150
total project cost	\$38,800

Cost Estimate.....Parcel Area 6,000 square feet (0.14 acre)



The Gazebo pattern is based on a real project on at East 128th Street, south of Shaker Square. The site held no appeal to the neighborhood, with cars frequently running over the curbs and litter strewn about. The park has a landscaped earth berm that provide a physical barrier to cars and a neighborhood amenity where residents plant flowers and seasonal plants. The Gazebo provides a place for residents to sit, providing a passive sense of security and safety not previously found at this location.

Green Amenity Expansion

bike trail



- 1 existing bike trail
- 2 expand existing trail
- 3 flowering trees
- 4 tree buffer

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (800) \$1,200

landscape materials

topsoil \$25 per cubic yard (45) \$1,125

plant materials

6' flowering tree-flwg.plum \$200 ea. (10) \$2,000

low mow seeding \$0.12 s.f. (3,200) \$384

furnishings

waste receptacles \$600 ea. (1) \$600

5' stone seat walls \$500 ea. (2) \$1,000

Green Amenity/Bike Trail Expansion Total Cost Estimate

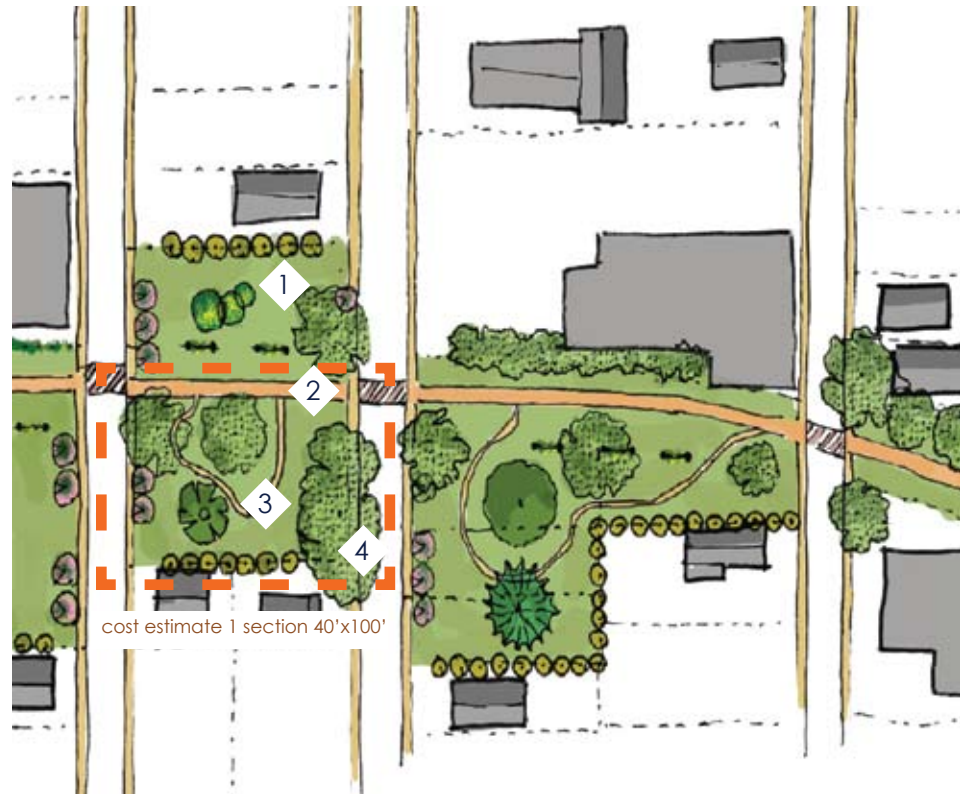
subtotal cost \$3.18 per square foot **\$5,209**

contingency 10% \$520

design/engineering 10% \$520

total project cost **\$6,249**

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



Green Amenity Expansion uses strategically located vacant properties to expand upon an existing green area by allowing the green area to take priority. Expanding an existing amenity helps to absorb surplus land, making the remaining vacant parcels more valuable for development.

Green Amenity Expansion *pocket park*



- 1 existing bike trail
- 2 expansion for pocket park
- 3 flowering trees
- 4 tree buffer

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

landscape materials

topsoil \$25 per cubic yard (45) \$1,125

plant materials

8' evergreen-spruce, fir \$250 ea. (12) \$3,000

6' flowering tree-flwg, plum \$200 ea. (3) \$600

low mow seeding \$0.12 s.f. (3,200) \$384

fencing

6' woodframe/wire \$40 l.f. (60) \$2,400

Green Amenity/Pocket Park Total Cost Estimate

subtotal cost \$3.18 per square foot **\$8,009**

contingency 10% \$800

design/engineering 10% \$800

total project cost **\$9,609**

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



Parcels that are adjacent to existing houses will require special treatment in a Green Amenity Expansion. Tall hedges, rapidly growing trees, or sections of fencing may be needed to provide adjacent homeowners with privacy and separation from a public amenity.

Central Green *market garden*



- 1 fruit trees
- 2 walkway
- 3 food crops
- 4 berry bushes

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (50)\$1,000

landscape materials

planting mixture \$45 per cubic yard (90)\$4,000

mulch \$40 per cubic yard (25)\$1,000

furnishings

rainbarrels \$250 ea. (6)\$1,500

irrigation \$1.25 s.f. (4,000)\$5,000

fencing

6' woodframe/wire \$40 l.f. (340)\$13,600

entry gate \$1,500 ea. (1)\$1,500

Central Green/Market Garden Total Cost Estimate

subtotal cost \$3.45 per square foot.....\$27,600

total project cost**\$27,600**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



Multiple adjacent parcels can be assembled to establish a market garden. A one-acre site is preferred, but smaller sites can still yield a substantial amount of produce for sale or local consumption. Soil testing will be needed to ensure that food crops can be safely grown on a specific site.

Central Green *natural park*



- 1 shrubs
- 2 gravel path
- 3 utility shed
- 4 evergreen trees

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (50)\$1,000

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (2,400)\$3,600

landscape materials

planting mixture \$45 per cubic yard (150)\$6,750

mulch \$40 per cubic yard (25)\$1,000

nursery stock

seed mix \$0.28 s.f. (2,000)\$560

native plant seedlings 32 plug flats \$128 ea. (50)\$6,400

8'evergreen-spruce, fir \$250 ea. (12)\$3,000

tree liners \$100 ea. (15)\$1,500

rye seeding \$0.10 s.f. (1,000)\$100

irrigation \$1.25 s.f. (4,000)\$5,000

Central Green/Natural Park Total Cost Estimate

subtotal cost \$2.99 per square foot\$23,910

contingency 10%\$2,390

design/engineering 15%\$3,590

total project cost\$29,890

Cost EstimateParcel Area 8,000 square feet (0.18 acre)



Two or more vacant properties can be planted as a low-maintenance community green space.

Community Garden



- 1 sidewalks
- 2 flowering trees
- 3 seating
- 4 gardens

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (80)\$3,000

landscape materials

planting mixture \$45 per cubic yard (90)\$4,000

mulch \$40 per cubic yard (18)\$720

plant materials

low mow seeding \$0.12 s.f. (3,200)\$384

furnishings

rainbarrels \$250 ea. (2)\$500

irrigation \$1.25 s.f. (3,200)\$5,000

fencing

6' woodframe/wire with gate \$40 l.f. (200)\$8,500

Community Garden Total Cost Estimate

subtotal cost \$3.00 per square foot\$18,000

total project cost**\$18,000**

Cost Estimate.....Parcel Area 6,000 square feet (0.14 acre)



Proximity to an elementary school and single family homes with small yards make community gardens a viable vacant land strategy in some neighborhoods.

Corner Gateway



- 1 tree buffer
- 2 pavement
- 3 optional event area
- 4 art seating

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (1,300 s.f.) \$2,000

landscape materials

topsoil \$25 per cubic yard (10) \$250

planting mixture \$45 per cubic yard (12) \$550

mulch \$40 per cubic yard (5) \$200

plant materials

low mow seeding \$0.12 s.f. (2,000 s.f.) \$240

perennial plant materials \$1,760

furnishings, art elements, shelter/structure

To be designed (site-specific) \$2,000

Corner Gateway Total Cost Estimate

subtotal cost \$0.80 per square foot \$7,000

contingency 10% \$700

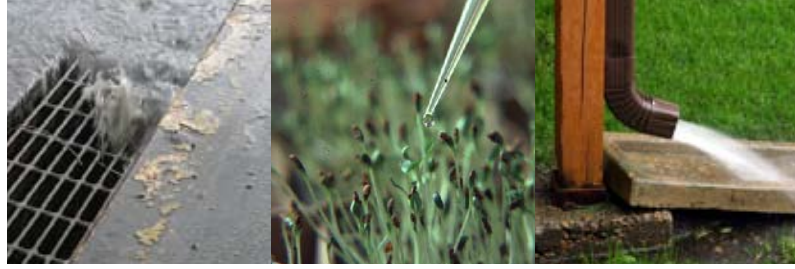
design/engineering 15% \$1,050

total project cost **\$8,750**

Cost Estimate.....Parcel Area 5,600 square feet (0.13 acre)



A pavilion structure at the farmer's market site would broaden the use of a corner vacant property to include community meetings, leisure gatherings, a play area for children, concerts on special occasions, in addition to farmer's market. The pavilion could incorporate seating and solar lighting to encourage pedestrian traffic. A paved or gravel area is appropriate around the structure, but the rest of the site could remain grass or ground cover.



Raingarden

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (50)	\$1,000
connections to drain adjacent buildngs	\$1,000

landscape materials

topsoil \$25 per cubic yard (7)	\$175
planting mixture \$45 per cubic yard (15)	\$675
mulch \$40 per cubic yard (5)	\$200

plant materials

12' shade tree-river birch, maple \$350 ea. (1)	\$350
6' flowering tree-flwg.plum \$200 ea. (2)	\$400
4' upright shrub-viburnum, thuja \$80 ea. (5)	\$400
3' spreading shrub-roses, holly \$50 ea. (9)	\$450
low mow seeding \$0.12 s.f. (1,000)	\$120
grasses-perennials \$5 s.f. (100)	\$500

fencing

4' wood frame/wire \$30 l.f. (40)	\$1,400
post treatment \$75 ea. (2)	\$150

furnishings

rain barrels \$250 ea. (1)	\$250
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Raingarden Total Cost Estimate

subtotal cost \$1.77 per square foot	\$7,070
contingency 10%	\$700
design/engineering 15%	\$700
total project cost	\$8,470

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



- 1 rain barrel
- 2 fence
- 3 grasses
- 4 perennials



Rain gardens are an effective way to manage stormwater run-off from rooftops. The back part of a vacant lot could be converted into a raingarden by directing downspouts from adjacent roofs into the garden. The front of the lot could be used for more active uses or as a garden with seating or as additional parking for the residents on the street.

Raingarden and Parking

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (50) \$1,000
 connections to drain adjacent buildngs \$1,000

paving materials

compacted crushed gravel \$1.50 s.f. (250) \$375
 6" pervious concrete \$12.50 s.f. (450) \$5,625

landscape materials

topsoil \$25 per cubic yard (10) \$250
 planting mixture \$45 per cubic yard (20) \$900
 mulch \$40 per cubic yard (5) \$200

plant materials

12' shade tree-river birch, maple \$350 ea. (1) \$350
 6' flowering tree-flwg.plum \$200 ea. (2) \$400
 4' upright shrub-viburnum, thuja \$80 ea. (5) \$400
 3' spreading shrub-roses, holly \$50 ea. (9) \$450
 low mow seeding \$0.12 s.f. (1,000) \$120
 grasses-perennials \$5 s.f. (100) \$500

fencing

4' wood frame/wire \$30 l.f. (80) \$2,400
 post treatment \$75 ea. (4) \$300

furnishings

rain barrels \$250 ea. (2) \$500

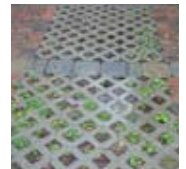
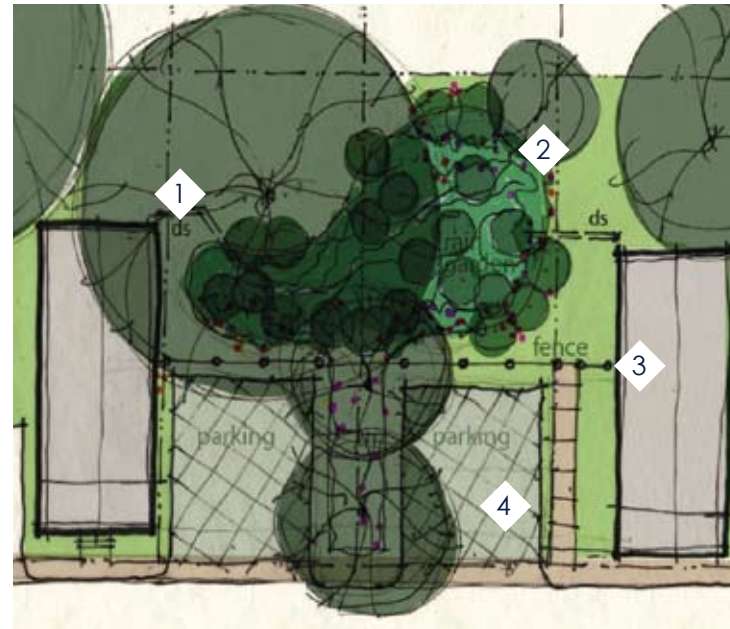
Raingarden/Parking Total Cost Estimate

subtotal cost \$1.85 per square foot **\$14,770**
 contingency 10% \$1,377
 design/engineering 15% \$2,066
 total project cost **\$17,213**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



- 1 downspout
- 2 rain garden
- 3 fence
- 4 pervious pavement



Rain gardens are an effective way to manage stormwater run-off from rooftops. The back part of a vacant lot could be converted into a raingarden by directing downspouts from adjacent roofs into the garden. The front of the lot could be used for more active uses or as a garden with seating or as additional parking for the residents on the street.

Bioretention



- 1 parking lot
- 2 roof
- 3 lawns
- 4 bioretention

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (50)\$1,000

walkway/paving materials

compacted crushed gravel \$1.50 s.f. (1,800)\$2,700

landscape materials

topsoil \$25 per cubic yard (20)\$500

mulch \$40 per cubic yard (80)\$3,200

plant materials

low mow seeding \$0.12 s.f. (3,700)\$444

grasses-perennials \$5 s.f. (2,500)\$12,500

Bioretention Total Cost Estimate

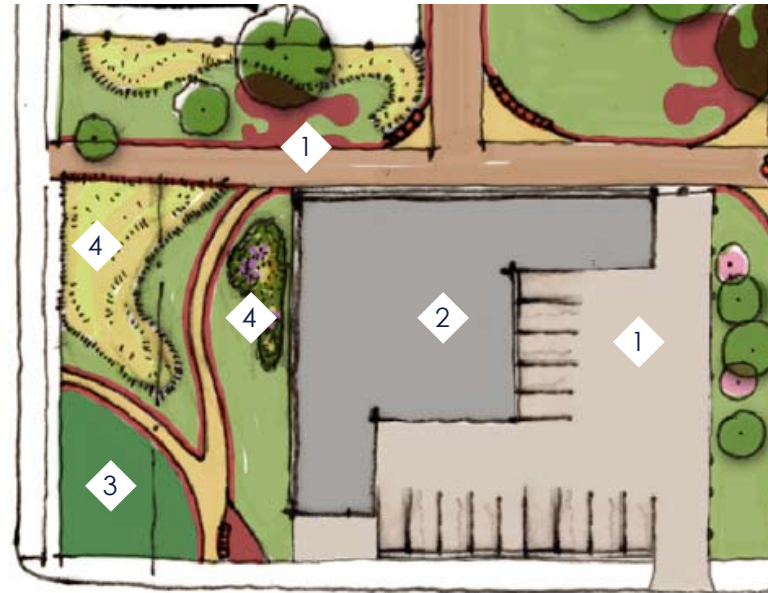
subtotal cost \$2.54 per square foot\$20,844

contingency 10%\$2,080

design/engineering 15%\$3,120

total project cost**\$26,044**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



Vacant sites near parking lots and other paved surfaces can be used to provide bio-retention areas for managing stormwater. Bioswales and rain gardens must be designed and engineered in response to the soil conditions and water volumes at a specific site.

Phytoremediation



*heavy metals (i.e. lead, arsenic)
pesticides
petroleum
volatile organic compounds*

Cost estimates for the phytoremediation process are dependent on many factors including levels and type of toxicity and the depth of the pollutants. Phytoremediation strategies are site-specific, so a cost can only be derived on a case by case basis once the unique conditions of a given parcel are assessed.

Phytoremediation has primarily been used on large-scale industrial sites and former military bases. However, phytoremediation is also a potentially useful strategy for reducing lead concentrations in residential neighborhoods. Spinach, indian mustard, sunflowers, and cabbage are effective hyper-accumulators—these plants extract lead and other heavy metals from the soil and retain these materials within plant tissues. Disposal of contaminated plant materials is an issue. Although these plants may be disposed of as residential waste, a safer approach would be to dispose of them at a hazardous waste facility, which would incur a significant cost.



Phytoremediation is a technique that uses plants to extract lead, arsenic, and other heavy metals, petroleum substances, and pesticides from the soil.

NEW DEVELOPMENT

Chapter 4



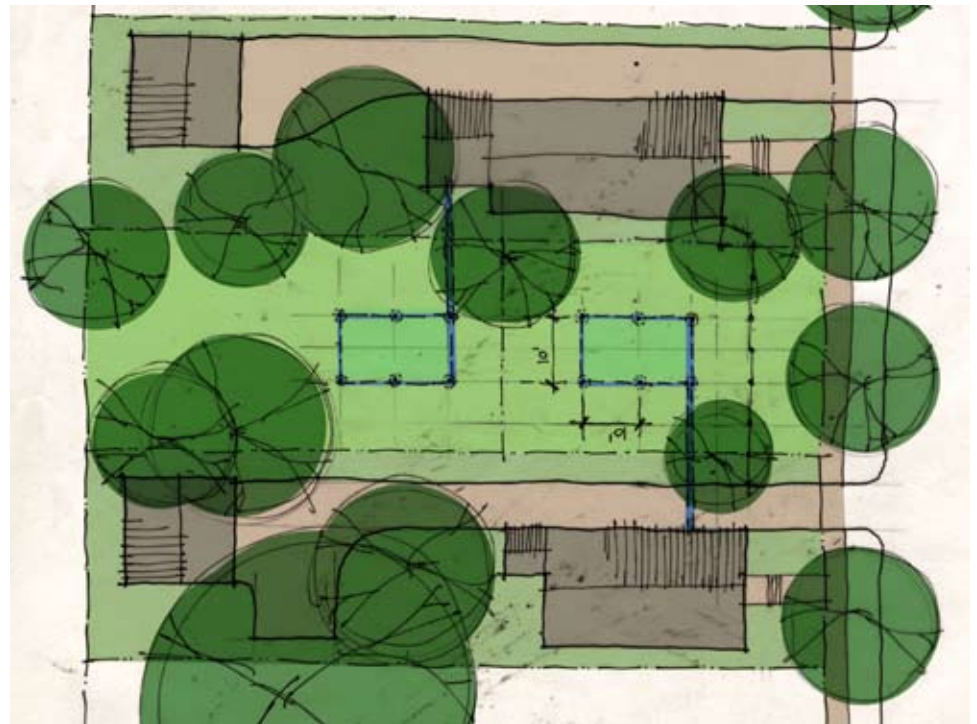
Geo Thermal Wells



Geo Thermal - Shared Utilities Total Cost Estimate

geothermal installation per house (\$21,000) (2)\$42,000

Geothermal technology uses the earth's renewable energy, just below the surface, to heat and cool a home, and to help provide hot water. Geothermal energy is extremely cost effective and environmentally friendly. Although the cost of installing a geothermal well is higher than installing a conventional heating system, a geothermal system results in significantly lower utility costs. Geothermal wells can be installed on a vacant site to generate energy for two adjacent houses.



Consolidated Parking *small lot*



- 1 house
- 2 tree buffer
- 3 utility shed
- 4 evergreen trees

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (25) \$500

driveway/paving materials

4" pervious asphalt \$45 per square yard (325) \$14,625

plant materials

8' evergreen-spruce, fir \$250 ea. (8) \$2,000

6' flowering tree-flwg, plum \$200 ea. (10) \$2,000

4' upright shrub-viburnum, thuja \$80 ea. (12) \$960

low mow seeding \$0.12 s.f. (1,200) \$144

Consolidated Parking Total Cost Estimate

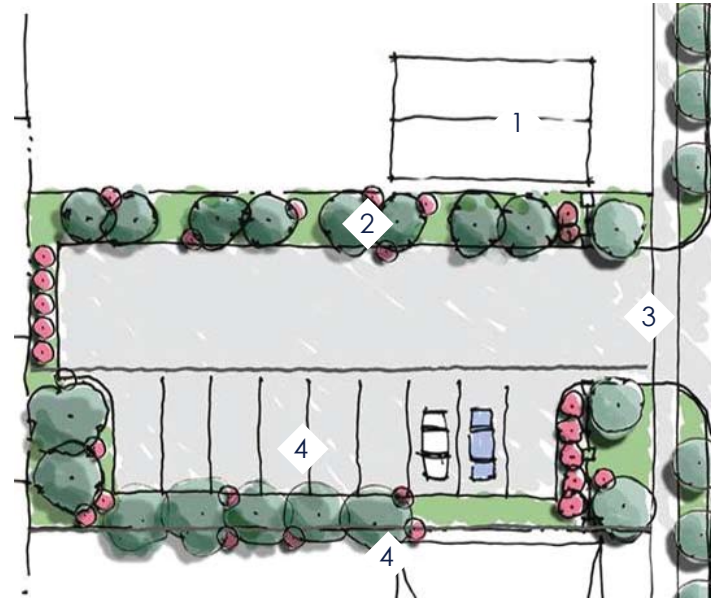
subtotal cost \$5.06 per square foot \$20,229

contingency 10% \$2,020

design/engineering 10% \$2,020

total project cost **\$24,269**

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



Small, off-street parking lots can be created on vacant lots with bio-swales and plantings for on-site stormwater drainage.

Side Lot Garage



- 1 driveway
- 2 garage
- 3 patio
- 4 tree buffer

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (100) \$2,000

landscape materials

topsoil \$25 per cubic yard (5) \$125

plant materials

8' evergreen-spruce, fir \$250 ea. (5) \$1,250

6' flowering tree-flwg. plum \$200 ea. (5) \$1,000

low mow seeding \$0.12 s.f. (1,600) \$192

walkway/paving materials

2" pervious asphalt \$35 per square yard (75) \$2,626

4" pervious asphalt \$45 per square yard (165) \$7,425

garage construction composite siding/asphalt shingles

one-car garage \$35-\$45 s.f. (240) \$8,400-\$10,800

two-car garage \$35-\$45 s.f. (380) \$13,000-\$17,000

Side Lot Garage Total Cost Estimate

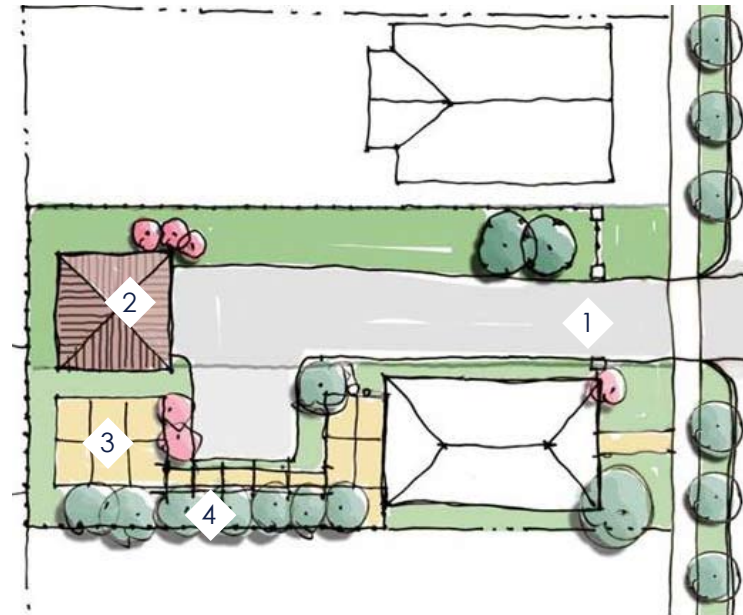
subtotal cost \$31,617

contingency 10% \$3,200

design/engineering 10% \$3,200

total project cost **\$38,017**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



A vacant lot can be deeded to an adjacent homeowner for the construction of a garage. A side lot garage should be carefully designed to maintain the character and rhythm of the street. Building materials should be consistent with surrounding houses. Landscaping and decorative fencing can be used to maintain the residential setback line.

Rear Lot Garage



- 1 driveway
- 2 garage
- 3 patio
- 4 covered walkway

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (100) \$2,000

landscape materials

topsoil \$25 per cubic yard (5) \$125

plant materials

8' evergreen-spruce, fir \$250 ea. (5) \$1,250

6' flowering tree-flwg. plum \$200 ea. (5) \$1,000

low mow seeding \$0.12 s.f. (1,600) \$192

walkway/paving materials

2" pervious asphalt \$35 per square yard (135) \$4,725

4" pervious asphalt \$45 per square yard (125) \$2,625

garage construction composite siding/asphalt shingles

one-car garage \$35-\$45 s.f. (240) \$8,400-\$10,800

two-car garage \$35-\$45 s.f. (380) \$13,000-\$17,000

Rear Lot Two-Car Garage Total Cost Estimate

subtotal cost \$31,917

contingency 10% \$3,200

design/engineering 10% \$3,200

total project cost **\$38,317**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



If a property has an adjacent vacant lot to the rear, a garage could be constructed in a variety of configurations. The street-facing facade of the garage should be carefully designed to maintain the scale and character of the surrounding neighborhood.

Consolidated Parking *garages*



- 1 tree buffer
- 2 green space
- 3 driveway
- 4 garages

Per Unit Cost Estimates (for 5 two-car garages)

site demolition/grading \$20 per cubic yard (400)\$8,000

driveway/paving materials

4"pervious asphalt \$45 per square yard (800)\$36,000

plant materials

8' evergreen-spruce,fir \$250 ea. (12)\$3,000

6' flowering tree-flwg.plum \$200 ea. (16)\$3,200

low mow seeding \$0.12 s.f. (12,000)\$1,440

garage construction composite siding/asphalt shingles

one-car garage \$35-\$45 s.f. (240).....\$8,400-\$10,800

two-car garage \$35-\$45 s.f. (380)\$13,000-\$17,000

Consolidated Parking Total Cost Estimate

subtotal cost.....\$133,640

contingency 10%.....\$13,360

design/engineering 10%.....\$13,360

total project cost**\$160,360**

Cost Estimate.....Parcel Area 16,000 square feet (0.37 acre)



If a property has an adjacent vacant lot to the rear, a garage could be constructed in a variety of configurations. To avoid the appearance of a row of garage doors along a residential frontage, several vacant properties could be consolidated as a green space, allowing access to garages through a communal driveway.

Accessory Dwelling Unit



- 1 apartment unit
- 2 driveway
- 3 tree buffer
- 4 patio

Per Unit Cost Estimates

site demolition/grading \$20 per cubic yard (100) \$2,000

landscape materials

topsoil \$25 per cubic yard (5) \$125

plant materials

8' evergreen-spruce, fir \$250 ea. (5) \$1,250

6' flowering tree-flwg. plum \$200 ea. (5) \$1,000

low mow seeding \$0.12 s.f. (1,600) \$192

walkway/paving materials

2" pervious asphalt \$35 per square yard (165) \$5,775

4" pervious asphalt \$45 per square yard (85) \$3,825

garage construction composite siding/asphalt shingles

two-car garage \$35-\$45 s.f. (380) \$13,000-\$17,000

with accessory dwelling unit \$100 s.f. (760) \$51,000-\$55,000

Two-Car Garage and Dwelling Unit Total Cost Estimate

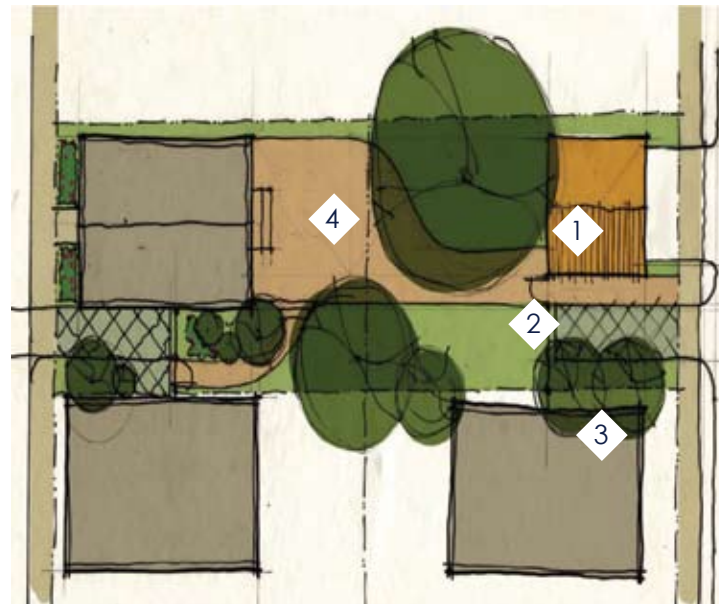
subtotal cost \$69,167

contingency 10% \$6,900

design/engineering 10% \$6,900

total project cost **\$82,967**

Cost Estimate.....Parcel Area 8,000 square feet (0.18 acre)



If a property has an adjacent vacant lot to the rear, a garage could be constructed to include an accessory dwelling unit. This would help to increase the range of housing typed in a neighborhood and provide an income stream to the homeowners if they choose to rent the garage unit.

Single House Infill



Per Unit Cost Estimates

home construction composite siding/asphalt shingles
all in cost (hard + soft) \$100 s.f. (2000).....\$200,000

garage construction composite siding/asphalt shingles
two-car garage \$35-\$45 s.f. (380)\$13,000-\$17,000
with accessory dwelling unit \$100 s.f. (760)\$51,000-\$55,000

Single House Infill Total Cost Estimate

total cost \$54.25 per square foot.....\$217,000

Cost Estimate.....Parcel Area 4,000 square feet (0.09 acre)



In some neighborhoods, market conditions support the development of infill housing on vacant lots. Sustainable materials and green technology can be employed to create energy-efficient and environmentally-friendly housing units.

Steps to Create a Successful Community Land Reuse Project

- 1) *Identify vacant land in your neighborhood that you are interested in, research and analyze the site in the context of your regional ecosystem:*
 - Use the Trust for Public Land's online Ohio Green Print at <http://www.ohiogreenprint.org/>. From this site you can learn about ownership, existing site conditions (soils, hydrology, watershed info, etc.), appropriate land reuses, neighborhood demographics and much more. You will also be able to map the site(s) you are interested in and see how it may connect in the long-term to other vacant land in your neighborhood to form a green network within your neighborhood and to connect to the rest of the city.
 - Contact your local community development corporation (CDC) for assistance with this. Find a listing of CDCs at Cleveland State University's Neighborhood Link at <http://www.nhlink.net> or call the Cleveland Neighborhood Development Coalition to ask what CDC serves your area. You can reach them at (216) 928-8100.
 - Review the Reimagining Cleveland Plan and analyze which land reuse strategies are appropriate and desirable given the location and existing site conditions.
 - Invite your neighborhood CDC or one of the technical assistance resource organizations to help you plan your visioning session and strategies to accomplish your project.
- 2) *Host a Visioning Session:*
 - Pick a date, location and time that will allow the most people to attend (usually early evening is best) and invite the CDC or technical assistance organization to attend and help you facilitate the session.
 - Invite a broad base of neighbors so that their ideas will be integrated into the project design and especially include the people that will use the site.
 - Have each person introduce themselves briefly and sign in. Be sure to get phone numbers, e-mail addresses and street addresses of everyone present.
 - Introduce the opportunity - the community can take control over vacant land and create a reuse project that is beautiful, productive and benefits the residents. Distribute/circulate the Reimagining Cleveland Plan and this Pattern Book to help people think about appropriate land reuses. Share information about the site that you learned from the Ohio Green Print.
 - Ask visioning questions like: What challenges can we begin to solve in our neighborhood or across the city using vacant land reuse strategies? How can an initial project for a vacant site lead to other neighborhood improvements or to an expanding network of vacant land reuse projects, which should extend beyond a neighborhood's boundaries? How can we encourage collaboration? What population of community members would we like to serve with this space? What are elements that we would like to include in the design? (community gardens, benches, wildlife

habitat, open space) What are some other creative or aesthetic elements we would like to add to the space? (forested area, stone pathway, art) What resources (physical and relational/people) will we need to make our project happen? What assets do we already have? How will we maintain the project once it is built?

- Summarize the ideas giving the main themes and reach agreement on what type of project to do and what elements to include.
- Brainstorm all of the different possible volunteer roles. Ask for a core group of volunteers to help organize the project: team leaders who will write the grant applications, recruit volunteers, and organize the work on the site.
- Thank participants for their input and let them know what the next steps will be.

3) *Hold a follow up meeting to plan all the details of your project :*

- Seek technical assistance from resource organizations available to help you with your specific project – see next page.
- Select your project design from the ReImagining Cleveland Pattern Book or design your own based on input from the visioning session.
- Develop a budget based on your own research with help from the Pattern Book (always double-check cost estimates, because prices will change over time)
- Decide how to raise funds for the project (grants are listed in the next section) and where to go for free resources.
- Set a timeline for your project.
- Create a plan for constructing your project and doing ongoing maintenance – what needs to be done, how often, who will do it – and ask neighbors to not only build it, but as importantly, make a commitment to maintain it.
- Identify a non-profit organization to be your fiscal agent for any project grants and ask for their commitment to do this. Be clear about the roles and responsibilities on their part and yours.

4) *Carry out your plan and keep neighbors involved in the process:*

- Circulate the design plan to neighbors through a flyer or newsletter and ask for volunteers and donations. Remember – there are lots of people who hate meetings but will gladly show up for volunteer work days.
- Possibly have a few mini-events leading up to the project work day to build a “buzz” for the event. A picnic on the proposed site before the planting, a mini-fundraiser or education campaign about the benefits of greenspace, community gardens, etc. Get the local kids involved with a lemonade stand to make money for the project.
- Once funding is in hand, work with your CDC or technical assistance organization to purchase supplies, bring in the right equipment and hold your volunteer work day(s). Be sure to end it with food/ refreshments to celebrate your great work!
- Carry out regular volunteer maintenance according to your plan.

Community Resources

These are some of the resources for advice, assistance, information, materials and funding to help you accomplish your project. No endorsement is implied for businesses listed, and no discrimination is intended of businesses not listed.

Your Starting Point - Online information on vacant land and mapping tool <http://www.ohiogreenprint.org/>

Advice on Appropriate Land Re-use Strategies Based on Existing Site Conditions:

Cleveland Urban Design Collaborative
www.cudc.kent.edu
Contact: Terry Schwarz
Email: tschwarz@kent.edu
Phone Number: (216)357-3426

Community and Market Gardening Training and Technical Assistance, Summer Sprout:

Ohio State University Extension
<http://cuyahoga.osu.edu/>
Phone number: (216) 429-8200 ext. 224
Email: communitygardening@ag.osu.edu

Green Corps Youth Gardens and Community Gardening Technical Assistance

The Cleveland Botanical Garden
<http://www.cb garden.org/>
Contact: Geri Unger
Phone number: (216) 707-2836

Urban Agriculture Training and Technical Assistance:

The New Agrarian Center / City Fresh
http://web.me.com/blueheron55/NAC_Site/Welcome.html
<http://www.cityfresh.org/>
Phone number: (440) 935-3106
Contact: Brad Masi
Email: brad@gotthenac.org

www.LocalFoodCleveland.org
Network of community gardeners, urban farmers, bee keepers and local food advocates

Land Bank Lots:

*City of Cleveland Land Bank
Community Development Department*
<http://www.city.cleveland.oh.us/Cityof-Cleveland/Home/Government/CityAgencies/CommunityDevelopment/LandBank>
Contact: Evelyn Strnad
Phone Number: (216) 664-4127

Neighborhood Greening Strategies, Planning and Organizing Volunteer Planting Projects:

Parkworks
www.parkworks.org
Contact: Nora Romanoff
Email: nromanoff@parkworks.org
Phone number: (216) 696-2122

Phyto-Remediation of Contaminated Sites:

Neighborhood Progress
www.neighborhoodprogress.org
Contact: Bobbi Reichtell
Email: blr@neighborhoodprogress.org
Phone Number: (216) 830-2770

Rain Gardens, Rain Barrels Bio-Swales and Other Stormwater Management Projects:

City of Cleveland Office of Sustainability
<http://www.city.cleveland.oh.us/Cityof-Cleveland/Home/Government/CityAgencies/PublicUtilities/Sustainability/GreenTips>
Contact: Frannie DiDonato
Phone Number: (216) 664-2444

The Cleveland Botanical Garden
<http://www.cb garden.org/>
Contact: Geri Unger
Phone number: (216) 707-2836

Northeast Ohio Regional Sewer District
<http://www.neorsd.org/stormwater.php>
Contact: Linda Mayer-Mack
Email: MackL@neorsd.org
Phone Number: (216)881-6600

PermaCulture, Wildlife Habitats and Sustainable Plant Communities:

*Cleveland Metroparks
Division of Natural Resources*
Contact: John Mack
Phone Number: (440) 331-8111

Green Triangle
<http://www.thegreentriangle.com/>
Contact: Hank Haberman
Email: hank@thegreentriangle.com
Phone Number: 330-283-8055

The New Agrarian Center
http://web.me.com/blueheron55/NAC_Site/Welcome.html
Phone number: (440) 935-3106
Email: bradmasi@earthlink.net

Funding Resources:

*CityWorks Grant Program
Cleveland Dept of Community Development*
www.city.cleveland.oh.us/portal/page/portal/CityofCleveland/Home/Government/CityAgencies/CommunityDevelopment/CityWorks#eligible
Contact: Donna Harris
Email: Dharris@city.cleveland.oh.us
Phone Number: (216)664-4100

Gardening for Greenbacks (for market gardens/urban farms)
Cleveland Dept of Economic Development
Contact: Ifeoma Ezepue
Email: iezepue@city.cleveland.oh.us
Phone: (216) 664-3622

Neighborhood Connections
<http://www.neighborhoodgrants.org/>
Contact: Tom O'Brien
Phone Number: (216)393-4640

ReImagining Cleveland – Demonstration Project Funding
Cleveland Dept of Community Development
www.city.cleveland.oh.us/CityofCleveland/Home/Government/CityAgencies/CommunityDevelopment
Contact: Donna Harris
Phone Number: (216) 664-4100
Also download application at:
www.neighborhoodprogress.org

Material Resources Amendments to Soil

Beer waste:

Great Lakes Brewing Company
Address: 2516 Market Avenue
Cleveland, Ohio 44113
Phone number: (216) 771-4404 ex.123

Manure:

Cleveland Metroparks Zoo
Contact: Compost/Recycling Coordinator
Address: 3900 Wildlife Way
Cleveland, OH 44109
Phone number:(216) 661-6500 ext. 4508

Food Waste to Create Compost:

Meal programs
School cafeterias
Hospitals
Food service

Westside Market
Contact: George A. Bradac
Address: 1979 West 25th Street
Cleveland, Ohio 44113
Phone number: (216) 664-3387

Leaves:

Landscaping companies

Kurtz Brothers Inc.
Address: 1180 Miller Road, Avon
Phone: (216) 986-7033

Soil and Soil Amendments:

Kurtz Brothers Inc.
Address: Avon 1180 Miller Road
Phone: (216) 986-7033

Rosby Resource Recycling
Address: 4963 Schaaf Lane
Brooklyn Hts., Ohio 44131
Phone number: (216) 661-6102 x3

THREE-Z-INC.

Address: 8700 Heinton Road
Phone number: (216) 524-4544

Material Resources Bricks

Deconstruction and demolition projects
Example: Stanard School site near East 55th and St. Clair Avenue

Material Resources Building materials

Habitat for Humanity ReStore
Address: 2110 W. 110th Street
Cleveland, Ohio 44102
Phone number: (216) 429-1299

Tools to Borrow

Community Housing Solutions
Address: 13944 Euclid Avenue, Suite 208
East Cleveland, Ohio 44112
Phone number: (216) 541-7000

Tools to Buy

Habitat for Humanity ReStore
Address: 2110 W. 110th Street
Cleveland, Ohio 44102
Phone number: (216) 429-1299 ex.223

Water Hydrant Equipment

Sutton Hardware
Address: 3848 Prospect Ave. NE
Cleveland, Ohio 44115
Phone number: (216) 696-8340

Lakeside Supply

Address: 300 West 117th Street
Cleveland, OH 44111

Water Hydrant Permits

(As of April 2009, must be registered with Summer Sprout Program through OSU Extension)

City of Cleveland Water Department
Address: 1201 Lakeside Ave.
Cleveland, Ohio 44114
Phone number: (216) 664-2444

Wood Chips

City of Cleveland Urban Forestry Dept
Rockefeller Greenhouse
Address: 750 East 88th Street
Cleveland, Ohio 44108
Phone number: (216) 664-3104

