RE-IMAGINING

A MORE SUSTAINABLE CLEVELAND

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Citywide Strategies for Reuse of Vacant Land

Adopted by the Cleveland City Planning Commission on December 19, 2008

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PURPOSE

Creating opportunities for all people, fair access to resources, commitment to healthy places for children, and using our ingenuity to capitalize on our assets are the values that are at the core of Re-imagining a More Sustainable Cleveland. This one year planning process explored strategies for reuse of vacant land with the goal of making Cleveland a cleaner, healthier, more beautiful, and economically sound city. The 30-member working group was convened by Neighborhood Progress in collaboration with the City of Cleveland and Kent State University's Cleveland Urban Design Collaborative with funding from the Surdna Foundation.

This report summarizes the goals, principles and strategies for returning vacant properties to productive use at the city-wide scale. It identifies policy changes that will enable the city to better make use of this growing resource. The report also includes a range of potential pilot projects meant to illustrate and test the principles, and to build capacity for the strategic management of vacant land throughout the city.

Going forward, the City of Cleveland has the opportunity to use its excess land in ways that:

- advance a larger, comprehensive sustainability strategy for the city,
- benefit low-income and underemployed residents,
- enhance the quality of neighborhood life
- create prosperity in the city
- and help address climate change.

With the support of community partners, the Surdna Foundation, and other funders, Neighborhood Progress, Inc. is committed to implementing pilot projects over the next several years and assisting the city and other partners in determining how to bring the most successful ones to scale.

FIG 1 **CLEVELAND POPULATION LOSS**[1]

Year	Population
1950	914,808
1990	505,616
2000	478,403
2007	438,042 (estimated)
2016	387, 039 (projected)

INTRODUCTION

Re-imagining a More Sustainable Cleveland starts from the premise that the loss of population over the last 60 years is not likely to be reversed in the near term and that Cleveland's future ability to attract and retain residents depends in large part on how the city adapts to population decline and changing land use patterns. The reuse of vacant land is crucial to Cleveland's potential to be a "green city on a blue lake."

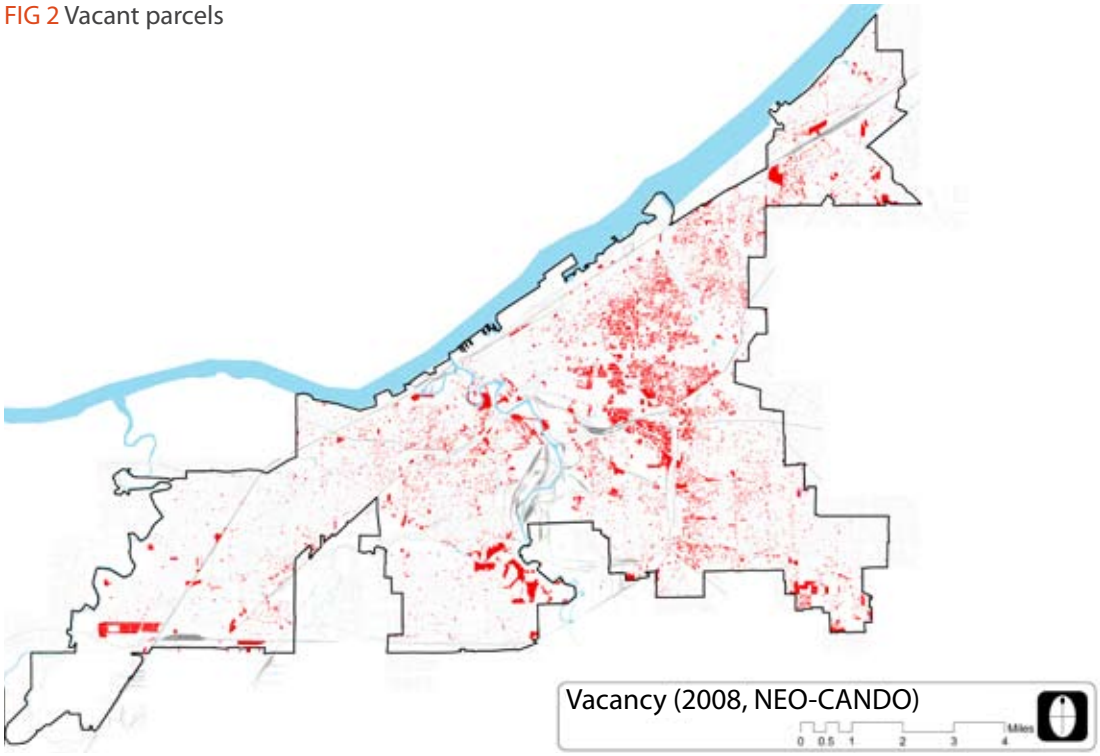
There are approximately 3,300 acres of vacant land within city limits, and an estimated 15,000 vacant buildings. Many of these vacant properties are poorly maintained and they diminish the value of the remaining, more viable buildings and neighborhoods in the city. The city demolishes about 1,000 vacant houses per year; private demolitions and fires are also reducing the number of derelict structures in the city. After demolition, surplus land becomes a raw asset for the city–a resource for future development as the city's population stabilizes and progress is made toward recovery. The *Re-imagining a More Sustainable Cleveland* working group was formed to explore ways to put this land to productive use. This includes short-term holding strategies to stabilize neighborhoods while we anticipate more permanent development solutions, and long-term reuse strategies for parts of the city where demand for traditional development is limited or non-existent.

The *Re-imagining a More Sustainable Cleveland* group included city staff, representatives from community development corporations, local non-profit organizations, the Cuyahoga County Planning Commission, the Northeast Ohio Regional Sewer District, and the Cleveland Metroparks. A complete list of participants is found in the Acknowledgements section.

The *Re-imagining a More Sustainable Cleveland* process was grounded in the principles of the Lake Erie Balanced Growth Initiative. This initiative encourages the establishment of priority development areas and priority conservation areas as a way of promoting smart growth while protecting Lake Erie and other natural resources in Northeast Ohio. Because of the growing supply of vacant land in Cleveland, the city is now in a position to make decisions about where development should occur and where land should be set aside and not developed.

1 The Northern Ohio Data and Information Service, February 2008.

FIG 2 Vacant parcels



The *Connecting Cleveland 2020 Citywide Plan* identifies Core Development Areas that concentrate development in catalytic locations along the lakefront and the river, Euclid Avenue and the opportunity corridor, and the downtown, airport, and University Circle [Figure 4]. These areas are, in effect, the priority development areas for the city of Cleveland. The *Re-imagining a More Sustainable Cleveland* process focuses on the parts of the city outside of the Core Development Areas, to identify ways to derive measurable benefits from vacant properties in these areas. These benefits include cleaner air and water, greater access to parks and recreation, improved local food security, and neighborhood-based economic development.

The lack of strong market demand and an abundance of vacant land create unprecedented opportunities to improve the city's green space network and natural systems. Capitalizing on this moment to set aside land for recreation, agriculture, green infrastructure, and other non-traditional land uses will benefit existing residents and help to attract new residents and development. By balancing current and future demands for new development with the conservation of key sites across the city, Cleveland can reinvent itself as a more productive, sustainable, and ecologically sound city.

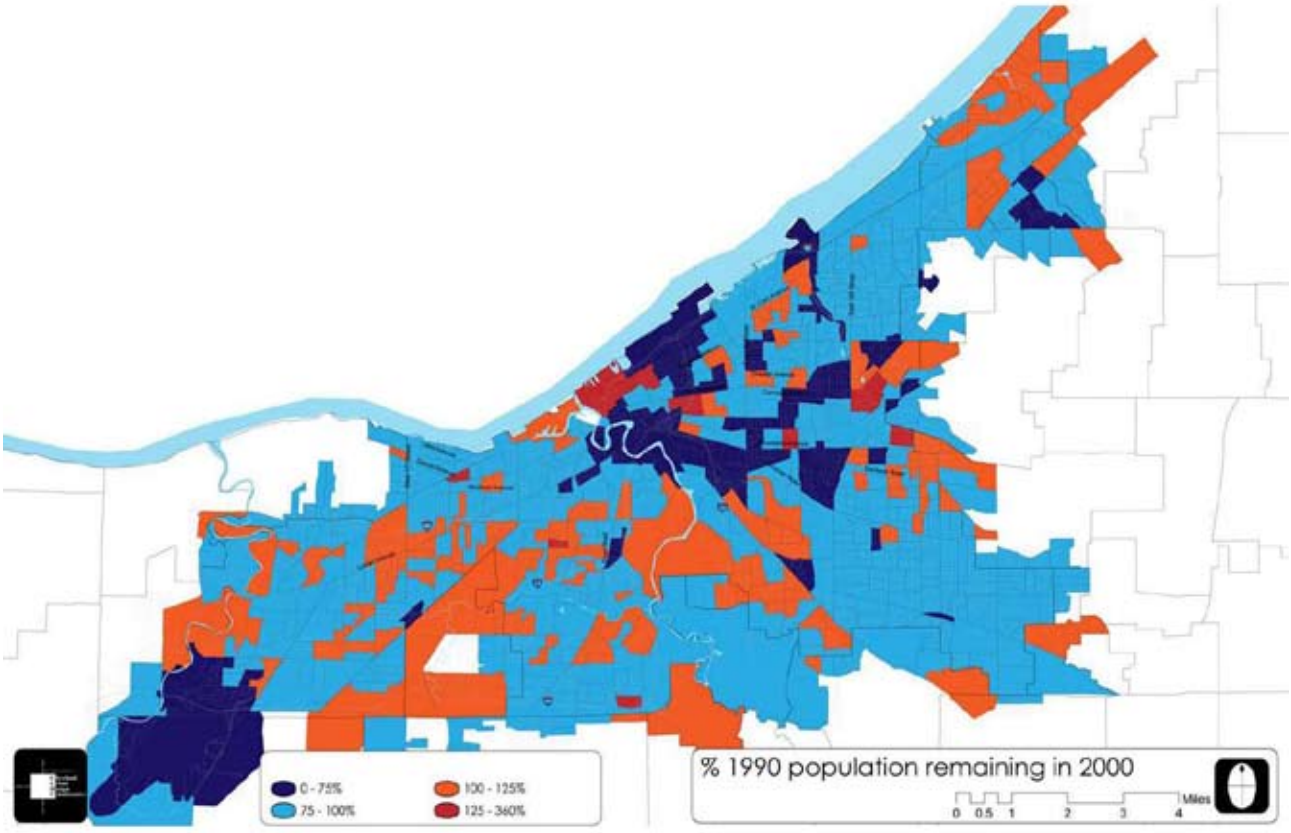


FIG 3 Population Change in Cleveland Neighborhoods

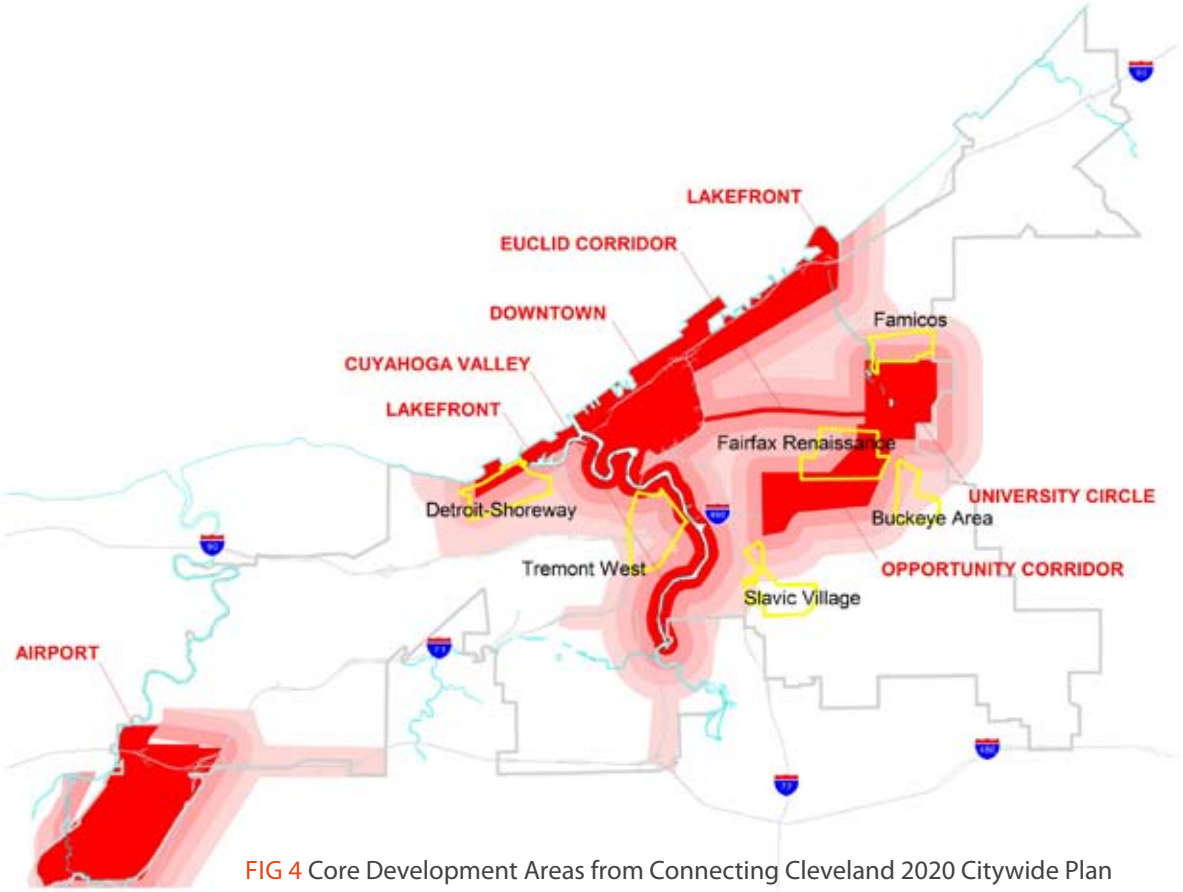


FIG 4 Core Development Areas from Connecting Cleveland 2020 Citywide Plan

EXECUTIVE SUMMARY

Given the large and growing inventory of vacant properties in the City of Cleveland, it is unlikely that all of the city's surplus land will be reused for conventional real estate development in the foreseeable future. The alternative land use strategies described in this document are intended to put vacant properties to productive use in ways that complement the city's long-term development objectives. Whatever the ultimate use of vacant properties in Cleveland will be, the following goals should be addressed:

PRODUCTIVE USE / PUBLIC BENEFIT Whether vacant properties are developed with buildings and infrastructure, preserved as open space, or put into productive use as agriculture or energy generation sites, they should provide an economic return, a community benefit, and/or an enhancement to natural ecosystems.

ECOSYSTEM FUNCTION Stormwater management, soil restoration, air quality, carbon sequestration, urban heat island effects, biodiversity, and wildlife habitat should be incorporated into future plans for vacant sites in the city.

REMEDIATION Remove the risk to human health and the environment from environmental pollutants at vacant sites, either with targeted remediation projects or with long-term incremental strategies.

This plan identifies a range of vacant land strategies including:

1. Neighborhood stabilization and holding strategies
2. Green infrastructure strategies to expand recreation opportunities and the green space network, improve ecosystem function and remediate contaminated properties
3. Productive landscapes (i.e. agriculture and energy generation)

The plan identifies criteria for implementing each of these strategies, as well as policy recommendations to support and promote the creative re-use of vacant properties throughout the city. The plan also describes a series of initial pilot projects and proposed research initiatives in support of a comprehensive citywide initiative to manage and reuse properties.

GOALS and STRATEGIES for VACANT LAND RE-USE

The goals of the *Re-imagining a More Sustainable Cleveland* process were to:

- Identify ways to derive quantifiable benefits from the city's growing inventory of vacant property;
- Promote opportunities for the strategic reuse of vacant sites that support redevelopment efforts in the City of Cleveland;
- Link natural and built systems within the city in ways that improve the quality of life and the long-term health of residents and the environment; and
- Increase community self-reliance for food and energy production

To achieve these goals, the working group explored a variety of strategies for using and managing vacant properties, including:

1. Neighborhood stabilization and holding strategies in prime development areas and transitional neighborhoods;
2. Green infrastructure strategies, including the expansion of parks and natural areas, and linkages between green space amenities within the city and region, ecosystem restoration to manage stormwater, reduce urban heat island effects, and enhance biodiversity, and remediation for contaminated sites; and
3. Productive landscapes as an economic development strategy;

NEIGHBORHOOD STABILIZATION and HOLDING STRATEGIES can be used to manage vacant and abandoned properties and establish a sense of stewardship and care in transitional neighborhoods. These strategies are intentionally low-cost and low maintenance. They are most effective in areas where development is likely in the near-term.

Neighborhood blocks with many unmanaged vacant lots result in lower residential property values. A study of property values in Philadelphia determined that derelict vacant sites caused a reduction in property values for surrounding houses of about 18%, while the clean-up and landscaping of vacant lots can increase adjacent property values by as much as 30%.[1]

Criteria for implementing holding strategies on vacant sites include:

- Site has strong development potential within the next five years.
- Property owner or community partner has the capacity to install and maintain landscape intervention.

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1 Susan Wachter, "The Determinants of Neighborhood Transformation in Philadelphia: Identification and Analysis—The New Kensington Pilot Study," Wharton School, University of Pennsylvania, the William Penn Foundation, and the Pennsylvania Horticultural Society, 2005.

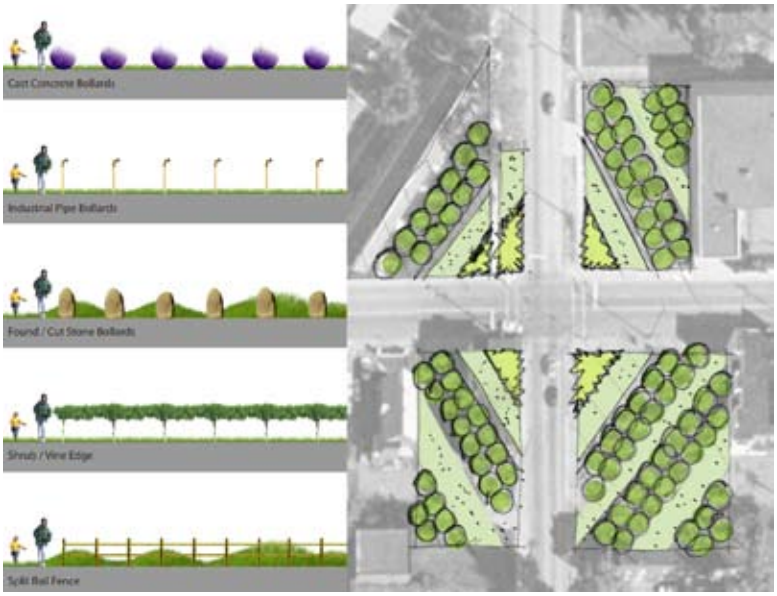


FIG 5 Trees and bollards on vacant sites enhance perceptions of maintenance and deter illegal dumping

FIG 6 Low-mow native plant materials create a patterned landscape as a holding strategy

In some neighborhoods where single vacant lots are scattered throughout residential blocks, lot consolidation and side yard expansion can be an effective way to achieve neighborhood stabilization. By encouraging existing property owners to take title to adjacent lots and become responsible for their maintenance, derelict sites are eliminated and these properties are returned to the city's tax rolls.

A variety of neighborhood stabilization and holding strategies are detailed in the *Vacant Land Pattern Book* produced by the Cleveland Urban Design Collaborative for Neighborhood Progress, Inc. These strategies include low-mow native landscapes that can be installed over large areas at a relatively low cost. Once established, low-mow landscapes require relatively little maintenance but reinforce a perception that vacant sites are being cared for. Trees can also be used as a holding strategy for vacant sites where development is anticipated. Rows of trees planted at distinct angles create a landscape that looks intentional, rather than neglected. These trees can be transplanted at the street edge when development occurs.

GREEN INFRASTRUCTURE

Green infrastructure is an interconnected network of open spaces that provides recreation resources, stormwater management, ecological benefits, and opportunities to remediate environmental toxins. Green infrastructure strategies for vacant sites in Cleveland are described below and include the expansion of the city's green space network, restoration of the city's ecosystems, and the remediation of contaminated sites.

GREEN SPACE NETWORK An abundance of vacant land and limited market demand provide opportunities throughout the city to create and enhance parks and green spaces. At the city-wide scale, vacant land can be assembled to create an integrated green space network that defines the city's physical form, preserves ecologically significant land, and makes key connections to green spaces and recreation opportunities elsewhere in the region. As vacant sites become available in the city's land bank, an assessment can be made as to whether the land is most suitable for development or whether it can best contribute to the overall green space network. Staff at the Cleveland Planning Commission have prepared a flow chart (Figure 7) to aid in making these decisions about the disposition of landbank lots. The flow chart establishes criteria to determine which sites should be preserved for a public purpose and which can be reallocated to private owners. The flowchart further distinguishes between short-term holding strategies for sites that have strong development potential, and long-term or permanent strategies for sites where development is less likely. Official adoption of this decision-making framework is the first step toward implementing a city-wide vacant land strategy.

The *Connecting Cleveland 2020 Citywide Plan* identifies locations for additional recreation and green space amenities throughout the city. The *Cuyahoga County GreenPrint* delineates a broader green space network for sites in the city and the region. These two plans are shown together in Figure 8 and they constitute a potential conservation zone for Cleveland. In the conservation zone, vacant land would be used for parks, recreation, reforestation, stormwater management, wildlife habitat, etc. Development would also be welcome in the conservation zone, but conservation easements and low-impact development strategies could be encouraged to maintain public access and protect sensitive natural resources.

Criteria for determining whether vacant land should become part of the city's parks and green space network include:

- Site is adjacent to or near an existing Cleveland Metroparks property or City of Cleveland park.
- Site is within an area designated as future green space in the 2020 Cleveland Citywide Plan and/or part of a greenway connection.
- Site contains a remaining forest stand that can provide a linkage to other areas and maintain/improve habitat migration patterns or the potential for natural habitat.
- Community partner has the capacity to install and maintain a public green space on the site.
- Neighborhood has insufficient amount of existing green space.

FIG 7 Land bank decision-making flow chart
(Cleveland City Planning Commission)

SHOULD THE SITE BE PRESERVED?

Does the site have characteristics that recommend it for a long-term green use?

decision factors

1. Culverted stream
2. Other riparian zone
3. Lack of nearby parks
4. Proximity to parks (existing or planned)
5. Land use in Citywide Plan
6. Connections to trails (existing or planned)
7. Scale

preservation strategy

yes enumerate unique characteristics
What treatment types are available for the site?

menu of treatments

1. energy generation: solar field
2. geothermal wells
3. energy generation: wind turbines
4. energy generation: ethanol production
5. clean fill cap (landfill sites)
6. storm water management: bio-retention
7. constructed wetland
8. riparian setbacks
9. green space: parks
10. green space: forest
11. green space: linkages
12. wildlife habitat
13. urban agriculture/commodity farming
14. tree nursury
15. bio-remediation, phyto-remediation, mycoremediation
16. storm water mangament: riparian setbacks, stream daylighting

choose a treatment

City, CDCs and other stakeholders conduct a qualitative review.
Make recommendations for implementing preservation strategy.

holding strategy

no

The new objective should be to return the vacant lot to a use that is consistent with the city's overall goals as articulated in the Citywide Plan.

What is the site's development potential?

[decision factors]

1. market typology
2. NPI Strategic Investment Areas
3. land bank hold areas
4. foreclosures
5. targeted demolition
6. proximity to schools and public buildings
7. proximity to core development areas
8. Who owns the property?
9. Is the land clean?
10. Has a plan been developed for the lot?
11. Has funding been commited to the project

strong development potential
(0 - 5 years)

menu of treatments

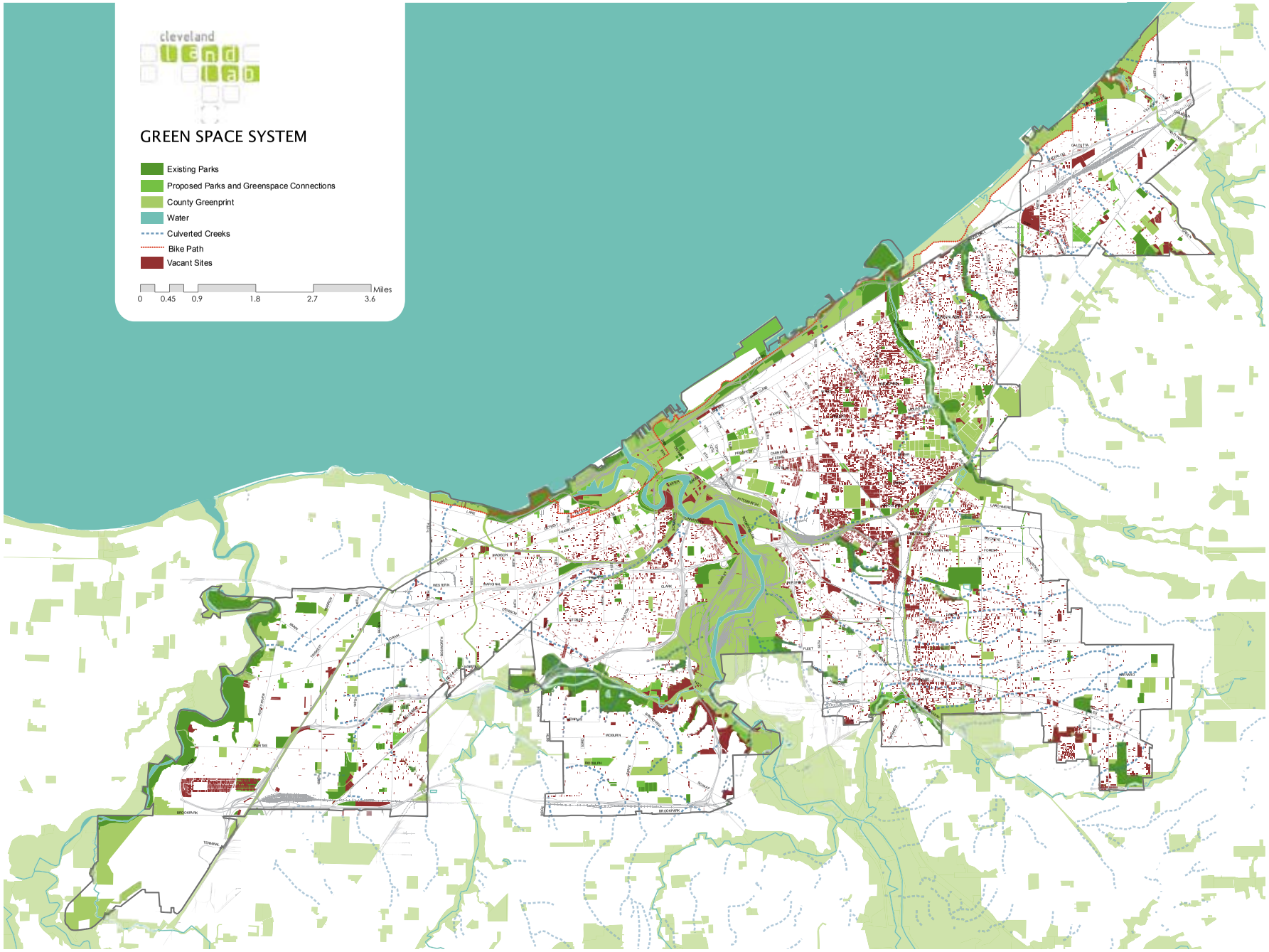
1. bio-remediation
2. landscape buffer
3. basic greening techniques

weak development potential
(5+ years)

menu of treatments

1. community garden
2. bio-remediation, phyto-remediation, myco-remediation
3. constructed wetland
4. deep tillage/pavement removal
5. basic greening techniques
6. solar field
7. urban agriculture/commodity farming
8. storm water management: riparian setbacks, stream daylighting

FIG 8 Green space system and existing vacant land



ECOSYSTEM RESTORATION/STORMWATER RETENTION Vacant land can be used to improve air and water quality, restore urban soils, increase biodiversity, and provide wildlife habitat. Urban development patterns tend to undermine local and regional ecosystems and limit the ability of nature to provide valuable services such as flood protection, air purification, climate regulation, erosion control, and biological habitat. But even in highly developed urban places like Cleveland, the functions of healthy ecosystems can be imitated and natural processes can be harnessed to provide quantifiable environmental benefits. [1]

Vacant land within the city can be used to recreate the functions of healthy ecosystems, so that natural processes are harnessed for environmental benefits. Ecosystem restoration can provide tangible benefits for the city. Water can be managed on vacant sites to imitate natural water cycling, vegetation can be introduced strategically to cool the air and filter water, and soils can be restored to support healthy vegetation and filter pollutants. For example, if trees were planted on vacant lots throughout the city, this could reduce the amount of stormwater runoff to be managed, since trees intercept rainwater and preventing it from entering the city's storm sewers. If done properly, this would reduce infrastructure costs and improve water quality.

Healthy ecosystems also contribute to the well-being of city residents. Studies show that access to nature—both the passive enjoyment of natural areas and active outdoor recreation—provide benefits such as better mental and emotional health, reduced stress, higher mental function and productivity, community cohesion and resilience, and increased safety. [2] Vacant land in Cleveland offers opportunities to integrate natural processes and human activity through the restoration of the city's ecosystems.

Soil and vegetation

Soil can take thousands of years to form but urban development often degrades soils so that they erode or are compacted. Soil ecosystems can be repaired gradually through targeted vacant land strategies.

Compaction is caused by buildings, construction equipment, and vehicular and foot traffic. Compaction damages soil structure and reduces infiltration rates, which increases runoff volume and flooding. Compaction also reduces spaces between soil particles for oxygen and water, making it difficult for vegetation to grow. Deep tillage and compost trenches can be used to reduce soil compaction on vacant sites, preparing them to support larger vegetation, accommodate agricultural uses, and increase stormwater infiltration.

Soil types and conditions vary across the city. An understanding of soil typologies should guide land use decision-making and strategies for vacant land reuse. *Hydric soils* are wetland soils; these soils developed under wet conditions and have the properties necessary to support wetland (hydrophytic) vegetation. Areas of the city with hydric soils are few, but if vacant land becomes available in these areas, they are ideal locations for constructing engineered wetlands.

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1 The Sustainable Sites Initiative, *Standards and Guidelines: Preliminary Report*. November 1, 2007.

2 Tzoulas, K., Korpela, K., Venn, S. et al., "Promoting Ecosystem and Human Health in Urban Areas Using Green Infrastructure: A Literature Review," *Landscape and Urban Planning* 81: 167-78 (2007), cited in The Sustainable Sites Initiative, *Standards and Guidelines: Preliminary Report*. November 1, 2007.

Soils are also classified by their ability to infiltrate water. Hydrologic soil types A and B offer the greatest potential for infiltration. Soil types C and D are heavier, clay soils. There are few areas in the city with A soils, but extensive areas with B soils (see Figure 9). Vacant areas with A and B soils are the most effective locations for implementing natural stormwater management practices such as bioswales and rain gardens. Soil compaction often reduces the infiltration capacity of A and B soils in urban settings, but this capacity can be restored as described above.

Vegetative cover improves soil structure and reduces sedimentation and erosion on vacant sites. Vegetation also provides wildlife habitat and increased biodiversity in urban settings. Vegetation provides shade and evapotranspiration to cool buildings and reduce energy costs. Vegetation also increases natural capacity for stormwater management and can filter pollutants from air and water. Vegetation, particularly in the form of a mature tree canopy, contributes to human health and well-being and has a measurable impact on residential property values.

Cleveland's patterns of urbanization have resulted in a significant loss of vegetation, as seen in Figure 10. Vacant land can be used to re-establish the city's tree canopy and other native vegetation (Figure 11). Design standards for new development on vacant sites can include requirements for re-establishing vegetation. And sites that have limited development potential can be used to re-establish the city's tree canopy. However, it is difficult to grow trees on compromised urban soils. Vacant land management should focus first on restoring soil structure through the planting of groundcovers and native low-mow grasses. As these plant materials become established, landscape strategies can mimic patterns of natural succession. Ground covers and low-mow grasses are a low-maintenance approach to managing short-term vacancy. Long-term vacancy can be used to recreate healthy soil ecosystems that will support trees and other larger vegetation on a permanent basis.

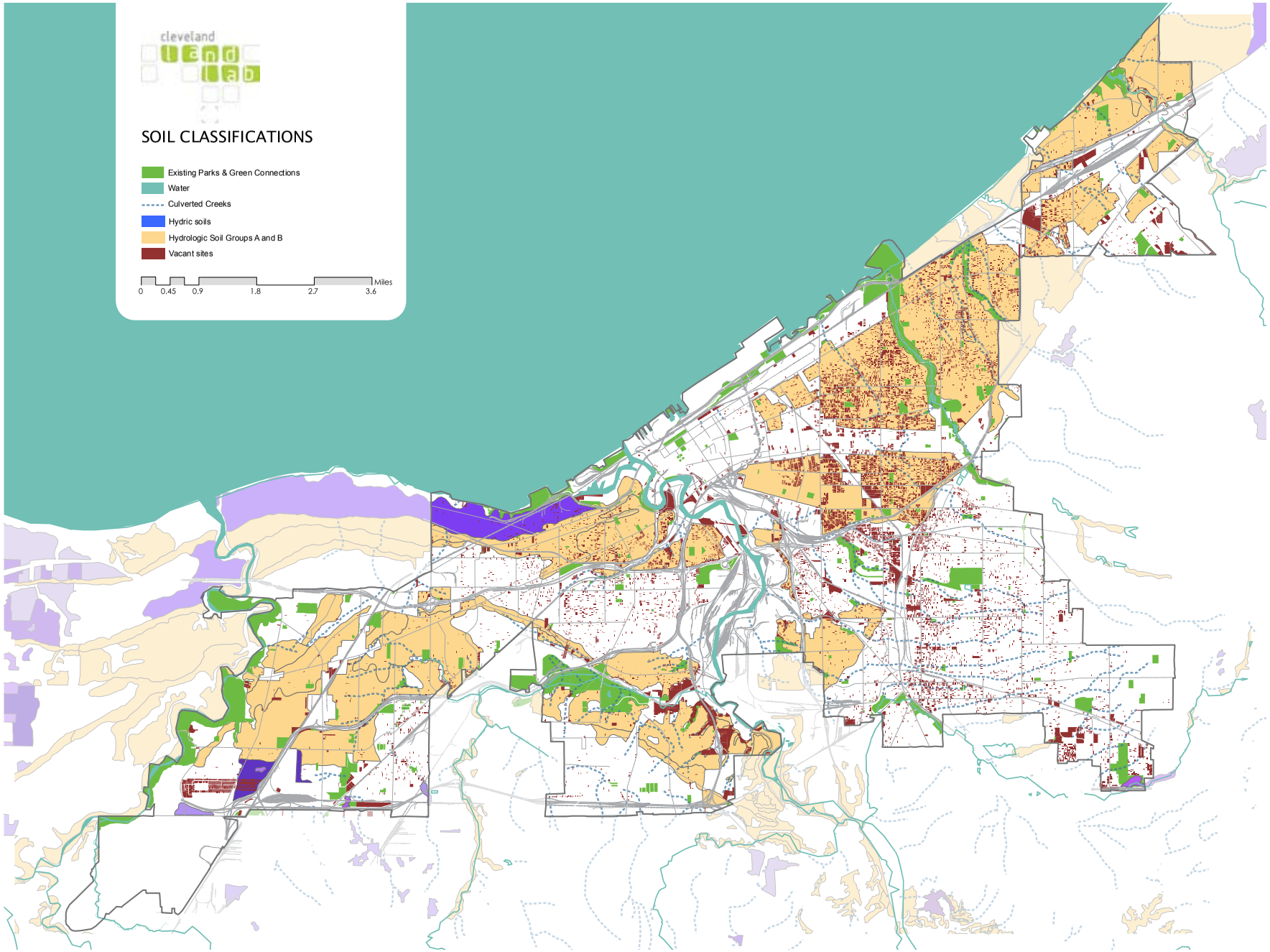
Water

Prior to urban settlement, the land in Cleveland was able to absorb much of the rain as it fell. Stormwater was absorbed and transpired by vegetation, or it slowly moved across the land and soaked into the soil. As the city grew, the percentage of impervious surfaces such as streets, sidewalks, and roofs within city limits increased dramatically. Today, much of the city's land consists of impervious surfaces. (Figure 12) This prevents the natural absorption of stormwater and results in increased runoff and compromised water quality.

As vacancy increases within the city, opportunities emerge to restore water balance by reducing impervious surfaces and restoring (or mimicking) natural hydrologic functions. The following criteria can be used to determine whether a vacant site can be used for stormwater management:

- Site is in a flood plain, an established riparian setback, or other flood-prone area and should not be developed.
- Site is identified in the Northeast Ohio Regional Sewer District's *Regional Intercommunity Drainage Evaluation* (RIDE) study as a problem area and should not be developed.
- Site is within an identified riparian area and can either be restored/conserved as open space or developed using conservation development practices.
- Site is within a headwaters area and can either be re-vegetated as open space or developed using conservation development practices.

FIG 9 Hydrologic Soil Groups



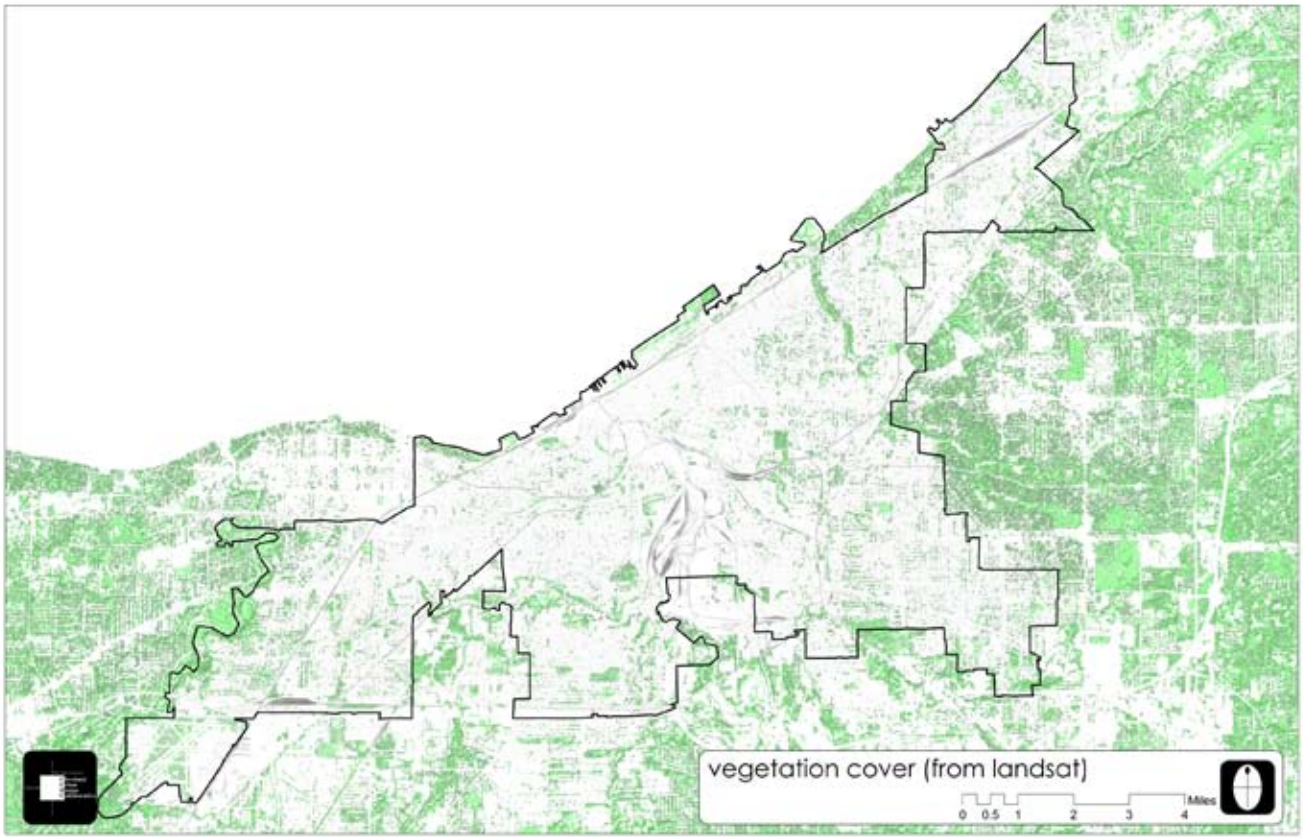


FIG 10 The tree canopy is sparse within the City of Cleveland

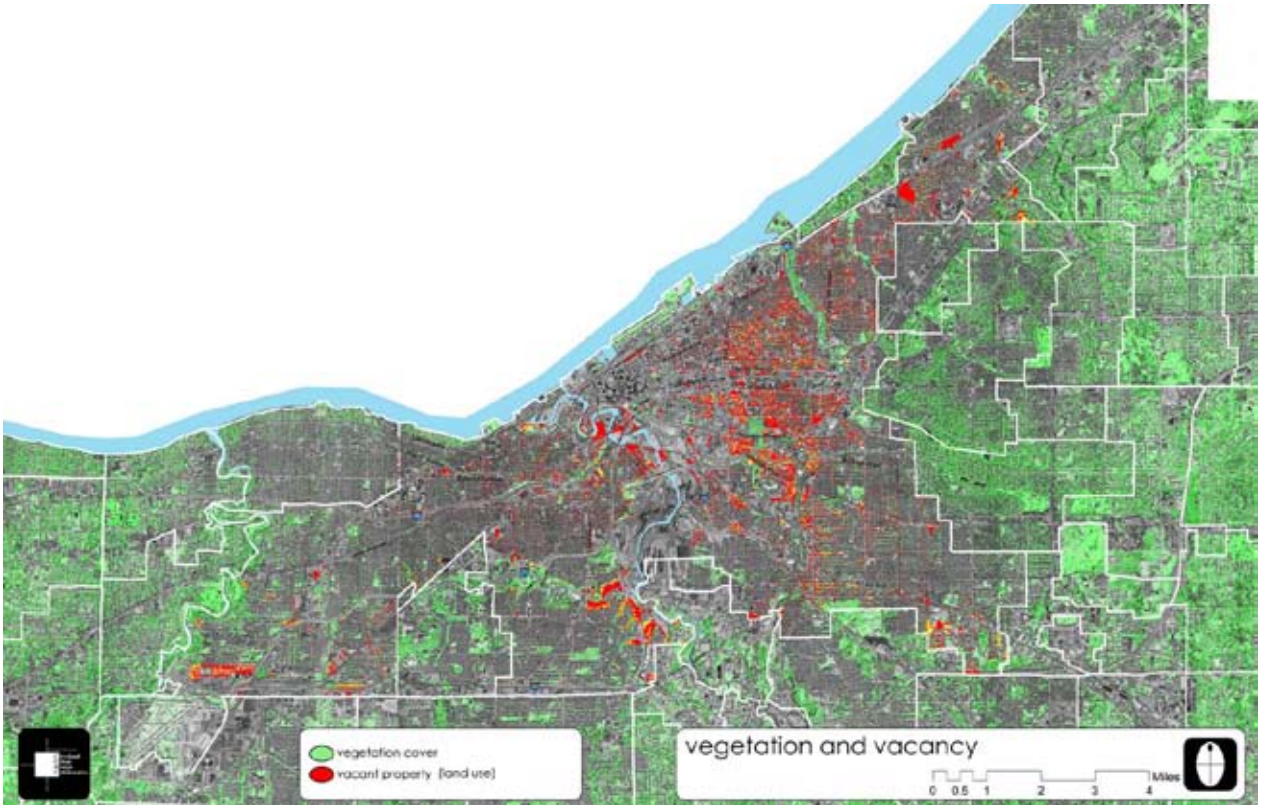


FIG 11 Vacant sites offer the potential to replenish vegetation and reestablish the tree canopy

- Site is identified in the Cuyahoga Soil and Water Conservation District's general wetland inventory of the County.
- Site can provide a linkage to other areas and maintain/improve habitat migration patterns and fish and aquatic habitats.

A more detailed and site-specific evaluation is needed to determine if vacant sites can be used to improve conditions in the following ecosystems:

Riparian Systems A riparian system is located along streams and rivers that occasionally flood and create unique ecosystems of soils, plant, and animals. In Cleveland, as in most urban areas, this system has been altered and it is not a healthy-functioning ecosystem. In many areas, streams have been culverted or completely buried and function primarily for water conveyance with marginal ecosystem value-function (See Figure 13). Vacant land can be used to establish or recreate heathy riparian systems within urban conditions. Riparian and headwaters areas for Cleveland are shown in Figure 14.

Recommended actions:

Streams: Identify opportunities to daylight buried streams, enhance existing streams, or recreate streams and their associated floodplains. Locate at existing or establish new pattern where appropriate. Ensure that system is connected and provides necessary hydrologic function (quantity and quality) to drainage area.

Riparian Corridors: Establish corridor limits using ecological principles (floodplains, soils, wetlands, slopes, and riparian vegetation). Create planning and design framework that allows either conservation or development projects within corridor.

Riparian Setbacks: Create regulations to establish minimal areas for ecosystem preservation. Determine appropriate method to define terms (setback distance, hydrologic functions, and environmental classifications) and means to administer regulations. Provide information to all stakeholders.

Conservation Design Strategies: Develop conservation guidelines integrating ecological principles into planning and design projects. Create document with goals/objectives and techniques, with monitoring/evaluation protocol.

Headwaters Systems A headwater system is located in the upper portions of a watershed and is where the drainage (surface and subsurface) patterns and processes begin for the watershed. Headwaters areas are critical for the efficient management of stormwater. Vacant land can be used to establish water quantity/quality objectives and initiate these strategies in the headwaters area. Headwaters and riparian areas for Cleveland are shown in Figure 14.

Recommended actions:

Low Impact Design-Stormwater Strategies: Establish objectives and techniques for low/minimal impacts to natural hydrologic system and existing site functions. Integrate strategies into planning and design process.

Wetland Systems: Map and document wetland criteria (hydric soils, hydrophytic vegetation, and water regime) and drainage patterns. Field verify wetlands and drainage patterns at site or local watershed level. Enhance existing lower quality, preserve existing higher quality, or create new wetland systems with appropriate vegetated buffers. Establish site design guidelines for development or conservation opportunities.

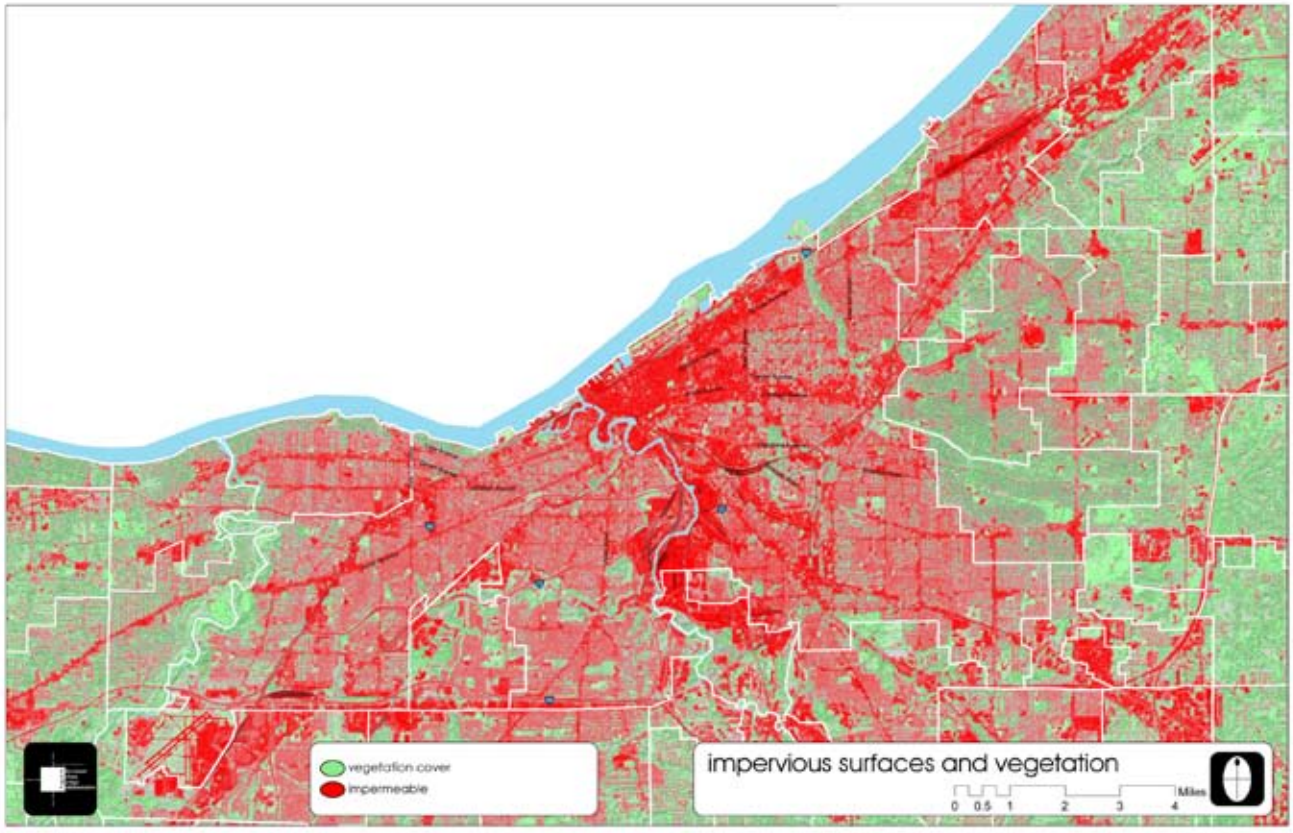


FIG 12 Impervious surfaces cover much of the land in the Cleveland.

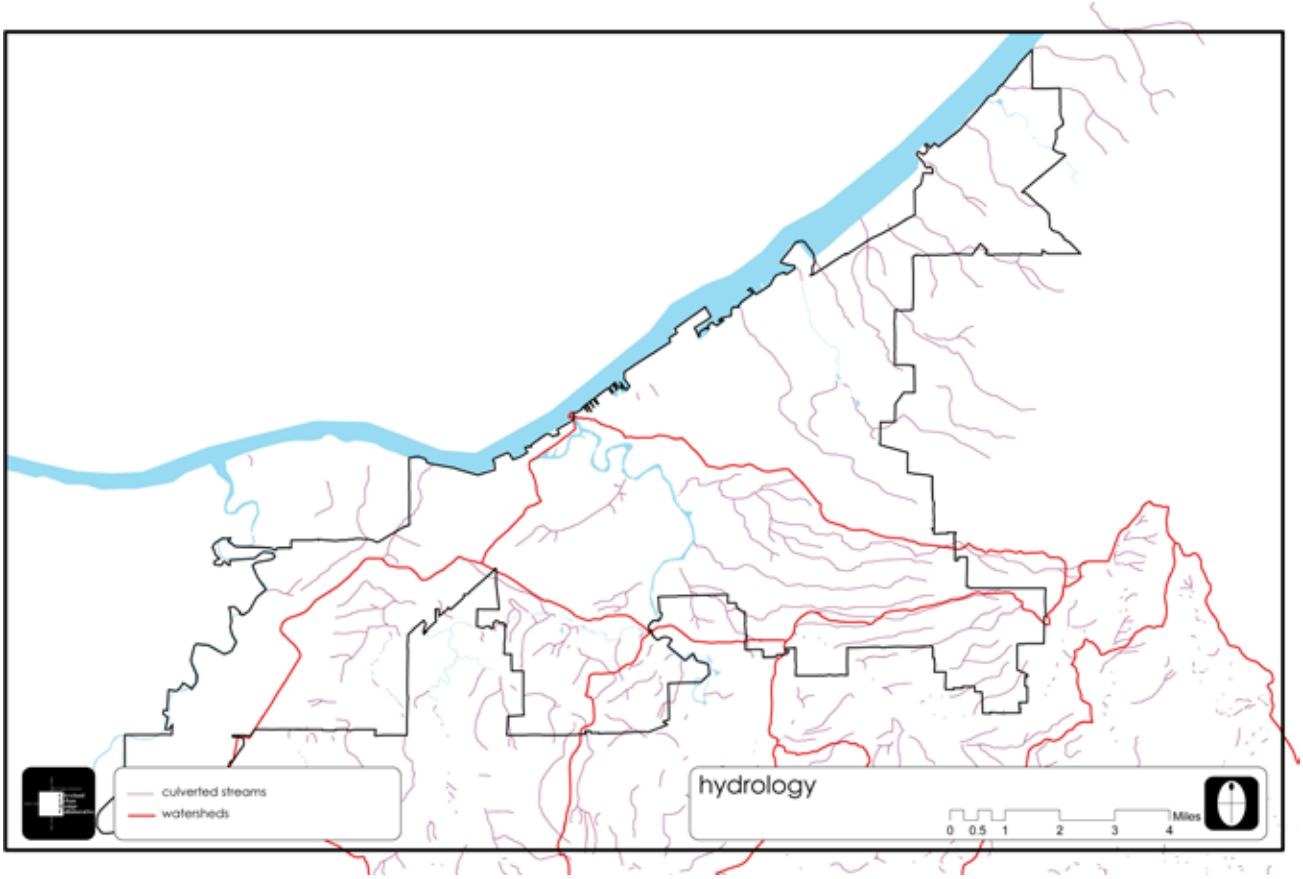


FIG 13 Creeks and streams throughout the city were culverted or buried to accommodate development.

FIG 14 Riparian and Headwaters System

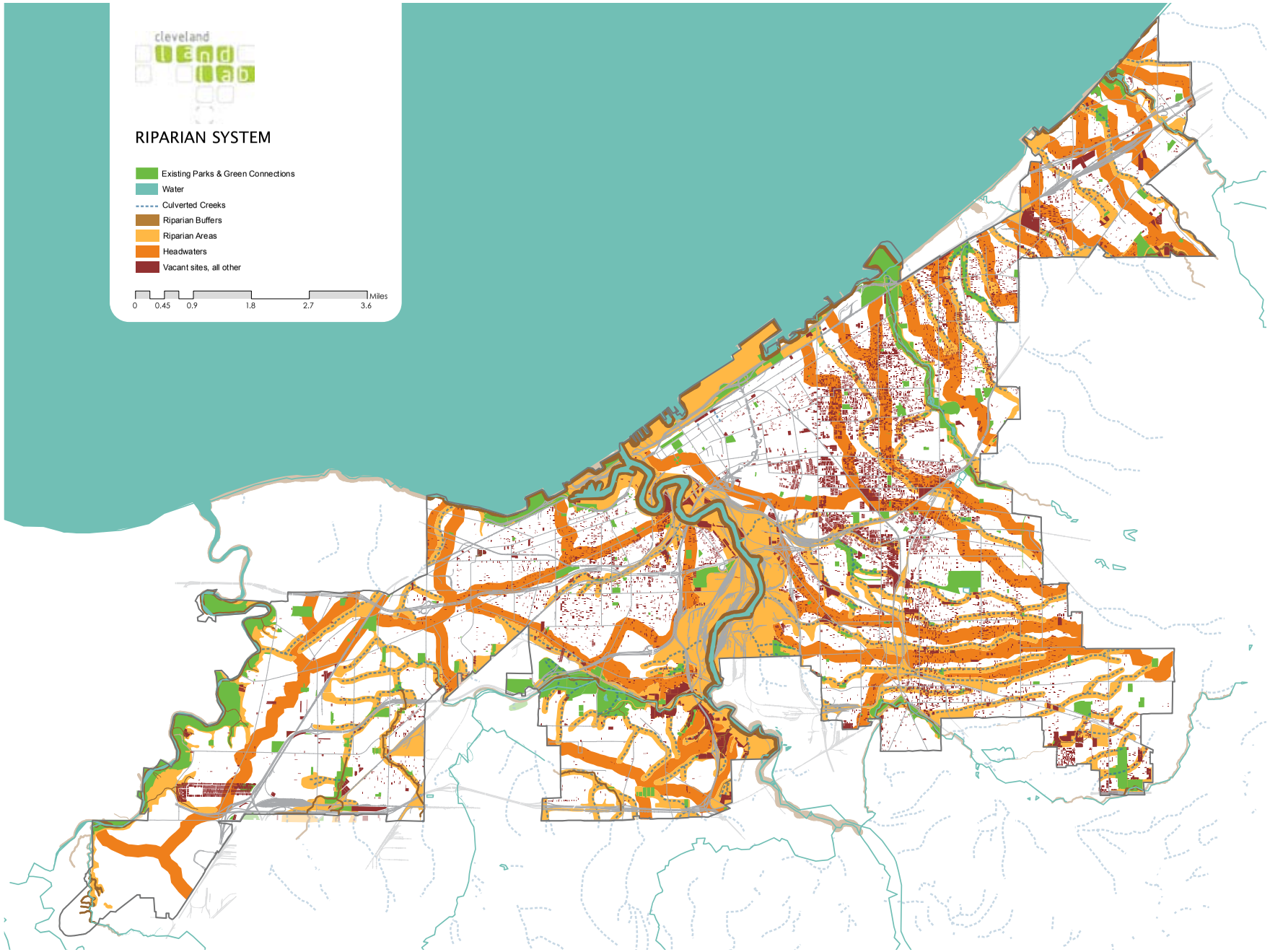


FIG 15 Low Impact Design for headwaters areas: bioretention swales

FIG 16 Swale for surface water conveyance. *Seattle Public Utilities drainage system project*

FIG 17 Rain garden for bioretention in residential areas.

Soil Systems: Map and document soil properties (HSG, water table, bedrock depth, permeability, moisture content, Ph, erosion, organic matter, and slope) from secondary sources. Field verify soil characteristics at site or neighborhood level. Establish preservation area boundaries and techniques.

Upland Vegetation Systems: Establish vegetation criteria (area, type, location, and quality), map/document relevant vegetated systems. Create guidelines for preservation, enhancement, or restoration of appropriate (native and naturalized) systems.

Engineered Naturalized Systems - Development Areas/Opportunity Sites Future development should be ecologically integrated into existing ecological systems, where this can be accomplished without excessive time or cost. The goal is to allow development as needed by the private market and incorporate ecological design principles as appropriate.

Recommended actions:

Low Impact Design – Stormwater Strategies: Establish objectives and techniques for low/minimal impacts to natural hydrologic system and existing site functions. Integrate strategies into planning and design process.

Engineered Ecosystems (streams, wetlands, riparian, upland, and managed turf systems): Establish ecosystem goals and criteria (area, type, and location) for application. Create guidelines for implementation of appropriate (native and naturalized) systems.

Hybrid Naturalized Systems–All Other Areas There will be areas within the City that are not initially designated for conservation or development. These areas can be used or altered over time as needed by local stakeholders. The important consideration should be that the changes benefit the local stakeholders and that there is a balance with conservation-development issues. These areas can be allowed to change as needed, with the application of standards and requirements in relation to the type and scale of the project.

Recommended actions:

Parcel(s) Level Hybrid Ecosystem (bioretention areas, rain gardens, upland meadows/prairie, naturalized woodlots, constructed wetlands, phytoremediation areas, low maintenance areas, and successional landscape management strategies): Establish ecosystem goals and criteria (area, type, function, and maintenance procedures) for application. Create guidelines for implementation of appropriate naturalized systems and provide evaluation standards.

FIG 18-19 Design concepts for vacant land in headwaters areas

Ecological Services

All landscapes provide ecological services (habitat, food production, air filtering, stormwater control, erosion control, and microclimate modulation). A natural or naturalized landscape can provide better and more efficient ecological services than a landscape dominated by impervious surfaces, turf, and minimal trees/shrubs. A general guideline should be to mimic natural landscape functions to the greatest extent possible, and that any additional vegetation and the more complex the ecosystem within a landscape – the more enhanced and beneficial the ecological services. To establish the planning and design framework of ecological services, six watershed scenarios were studied to determine the existing landscape functions and the potential benefits of vegetation strategies for ecosystem restoration on vacant sites. The study areas are not the only areas of the city where ecosystem restoration can occur; rather they represent a variety of urban conditions where different ecological benefits can be derived through vacant land management. Three of six study areas are included in this document.

The following land-cover descriptions were used in the watershed study areas:

- *Impervious Surfaces* Building, roads, roofs, parking areas, sidewalks, hardscape
- *Open Space – Scattered Trees (50-75% turf understory)* Active recreation parks, vacant lots (newly vacant-minimal trees), cemeteries (mostly turf)
- *Trees – Forest (native or naturalized shrub/groundcover understory)* Woods, wetlands, riparian areas
- *Trees – Grass/Turf* Passive recreation parks, cemeteries (mostly trees), wooded rear yards, wooded buffer areas, vacant lots (older vacant sites with trees, shrubs, grass)
- *Residential – Urban/Suburban (average .25 acre lot size)*

The following ecological services were modeled in each of the six study areas:

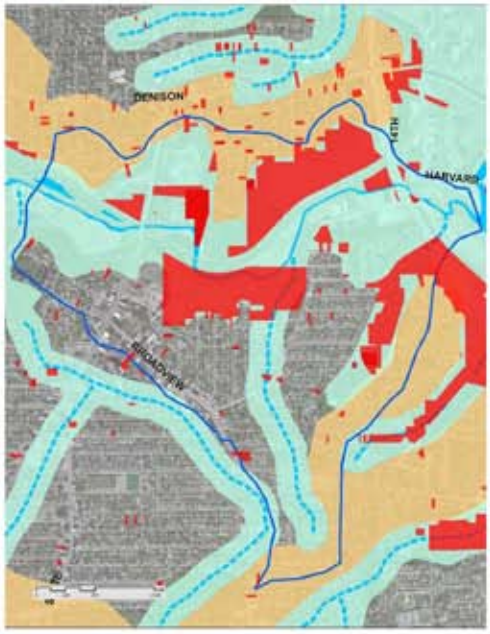
- Air Pollution Removal (carbon monoxide, ozone, nitrogen dioxide, particulate matter, sulfur dioxide)
- Carbon Storage and Sequestration
- Stormwater Control

Watershed Scenarios

St.Clair+E.105 (Figure 20)
Aggressive vegetation changes with all land-cover types. There is a variety of vacancy within the watershed so the intention is to equally apply land-cover changes in the watershed. Increase vegetation areas in all available land-covers with concentrations on vacant parcels. All of the vacant parcels were modeled for increased vegetation/re-vegetation and allowed for successional landscape changes. Predicted outcome: moderate to high increase to all ecological services in all land-cover areas.

Broadview+Harvard (Figure 21)
Vegetation changes in all land-cover types within the watershed with targeted concentrations to the existing impervious surfaces and residential areas. There are large existing vegetated vacant areas that will not be developed because of slope and soil conditions. These areas already provide ecological services so the intention was to increase these services in other land-cover areas. Predicted outcome: moderate increase to ecological services (major increase to stormwater services) in selected land-cover areas.

Harvard+Miles (Figure 22)
Vegetation changes with selected land-cover types because of smaller number and size of vacant lots available in watershed. The existing vacant lots relate more with the urban patterns than with ecosystem patterns, therefore land-cover changes dealing with vegetation will have to be designed to fit within the existing urban patterns in order to provide adequate ecological services. Predicted outcome: minor to moderate minor increases in ecological services (minor increase to stormwater services) in selected land-cover areas.



Watershed Study – Broadview+Harvard

Watershed Characteristics:

- Lower Big Creek Watershed with existing stream and culverted tributary
- Approximately 570 acres
- Majority of watershed is residential with commercial and industrial corridors of impervious surfaces
- Many areas of naturalized areas and public open spaces
- Majority of vacancy is industrial with environmental concerns and vegetated steep slopes
- Large areas of vacancy with a minimal scattered small lots

Watershed Analysis:

Current Land Cover Types

Impervious surfaces	143.3 acres (25.2 %)
Residential – medium density	233.2 acres (41.0 %)
Grass/scattered trees	26.7 acres (4.7 %)
Meadow/shrub	30.1 acres (5.3 %)
Trees/natural understory	135.6 acres (23.8 %)
Total Tree/Vegetation Canopy	135.6 acres (23.8 %)

Current Green Infrastructure Functions

- *Air Pollution Removal* — *14,017 lbs removed/yr ($32,378 value)*
- *Carbon Storage & Sequestration* — *5,833 total tons stored (45.41 tons annual)*
- *Stormwater – Quantity* — *193,906 CF storage ($387,813 savings)*

Watershed Recommendations:

Riparian Corridor Area (100 ft buffer): Limited potential of reestablishing main tributary surface hydrology (daylight or reconstruct stream channel (750 LF possible). Reestablish urban forest in all other vacant land in area should be higher priority.

Headwaters Area (500 ft buffer): Limited opportunity to construct stormwater wetlands or other stormwater collection facilities (raingardens etc...). Higher priority should be given for other vacant land to be vegetated and maintained as a successional landscape.

Vacant Land Available (approximate)

Riparian Corridor Area	78 acres
Headwaters Area	6 acres
All others areas	6 acres
Total Vacant Land	90 acres (16 %)
Total Tree/Vegetation Canopy	177 acres (31.0 %)

Projected Green Infrastructure Functions

- *Air Pollution Removal* — *18,238 lbs removed/yr ($42,128 value)*
- *Carbon Storage & Sequestration* — *7,590 total tons stored (59.09 tons annual)*
- *Stormwater – Quantity* — *624,648 CF storage ($1,249,296 savings)*

FIG 20 Broadview/Harvard Study Area

Watershed Study – St.Clair+E.105

Watershed Characteristics:

- Direct tributary to Lake Erie and entire watershed is culverted
- Approximately 513 acres
- Majority residential neighborhoods (240 acres) in middle and upper areas, with 2 commercial/retail corridors (St.Clair and E.105) that intersect watershed
- Minimal open space and natural areas
- Vacancy is a majority of residential parcels with commercial/retail and some industrial parcels
- Scattered vacancy with a range of medium and small lots

Watershed Analysis:

Current Land Cover Types

Impervious surfaces	150.2 acres (29.3 %)
Residential – medium density	239.8 acres (46.8 %)
Grass/scattered trees	50.1 acres (9.8 %)
Trees/grass+shrub understory	59.8 acres (11.7 %)
Trees/natural understory	12.7 acres (2.5 %)
Total Tree/Vegetation Canopy	72.5 acres (14.1 %)

Current Green Infrastructure Functions

- *Air Pollution Removal* — *7,495 lbs removed/yr ($17,312 value)*
- *Carbon Storage & Sequestration* — *3,119 total tons stored (24.28 tons annual)*
- *Stormwater – Quantity* — *85,453 CF storage ($170,907 savings)*

Watershed Recommendations:

Riparian Corridor Area (100 ft buffer): Limited potential of reestablishing main tributary surface hydrology (daylight or reconstruct stream channel (400 LF possible). Reestablish urban forest in all other vacant land in area should be higher priority.

Headwaters Area (500 ft buffer): Construct stormwater wetlands or other stormwater collection facilities (raingardens etc...) in as many areas as appropriate. All other vacant land should be vegetated and maintained as a successional landscape.

Vacant Land Available (approximate)

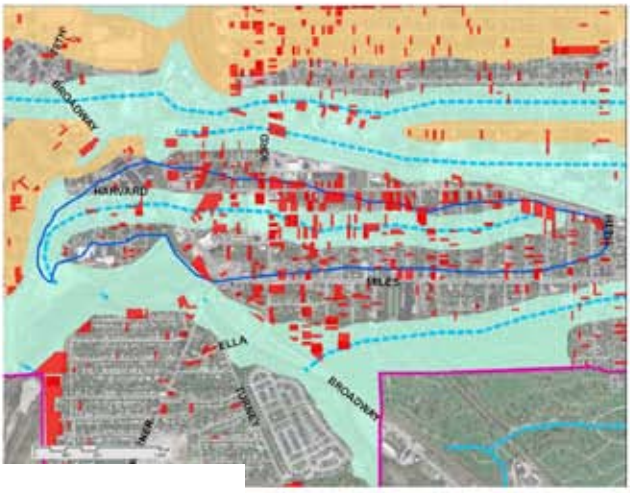
Riparian Corridor Area	18 acres
Headwaters Area	20 acres
All others areas	22 acres
Total Vacant Land	60 acres (12 %)
Total Tree/Vegetation Canopy	138 acres (27.0 %)

Projected Green Infrastructure Functions

- *Air Pollution Removal* — *14,313 lbs removed/yr ($33,061 value)*
- *Carbon Storage & Sequestration* — *5,956 total tons stored (46.37 tons annual)*
- *Stormwater – Quantity* — *160,085 CF storage ($320,171 savings)*

FIG 21 St. Clair and E 105 St. Study Area

Watershed Study – Harvard+Miles



Watershed Characteristics:

- Tributary to Mill Creek (Cuyahoga River) with entire watershed culverted
- Approximately 204 acres
- Majority of watershed is residential and impervious surfaces
- Minimal open space or natural areas
- Vacancy is a majority of residential parcels with minimal commercial/retail and industrial parcels
- Scattered and clustered vacancy with a range of medium and small lots

Watershed Analysis:

Current Land Cover Types

Impervious surfaces	69.2 acres (34.0 %)
Residential – medium density	74.1 acres (36.4 %)
Grass/scattered trees	22.0 acres (10.8 %)
Trees/grass+shrub understory	27.3 acres (13.4 %)
Trees/natural understory	10.8 acres (5.3 %)
Total Tree/Vegetation Canopy	38.1 acres (18.7 %)

Current Green Infrastructure Functions

- *Air Pollution Removal* — *3,941 lbs removed/yr ($9,102 value)*
- *Carbon Storage & Sequestration* — *1,640 total tons stored (12.77 tons annual)*
- *Stormwater – Quantity* — *216,402 CF storage ($432,804 savings)*

Watershed Recommendations:

Riparian Corridor Area (100 ft buffer): Potential of reestablishing main tributary surface hydrology (daylight or reconstruct stream channel (850 LF possible). Reestablish urban forest in all other vacant land in area should be higher priority.

Headwaters Area (500 ft buffer): Limited opportunity to construct stormwater wetlands or other stormwater collection facilities (raingardens etc...). Higher priority should be given for other vacant land to be vegetated and maintained as a successional landscape.

Vacant Land Available (approximate)

Riparian Corridor Area	20 acres
Headwaters Area	0 acres
All others areas	15 acres
Total Vacant Land	35 acres (17 %)
Total Tree/Vegetation Canopy	44.4 acres (21.8 %)

Projected Green Infrastructure Functions

- *Air Pollution Removal* — *4,591 lbs removed/yr ($10,605 value)*
- *Carbon Storage & Sequestration* — *1,911 total tons stored (14.87 tons annual)*
- *Stormwater – Quantity* — *50,436 CF storage ($100,872 savings)*

FIG 22 Harvard and Miles Study Area

REMEDIATION Environmental contamination is Cleveland's unfortunate legacy from the industrial era. Resources for cleaning up brownfields sites are typically tied to new development projects. This is a challenge for Cleveland, where environmental contaminants abound in places where development demand is very limited or in some cases, non-existent. Conventional brownfield clean-up, where tainted soils are removed and disposed of in toxic waste facilities, is cost-prohibitive without state and federal funding support. But this support is only available when a new development project is proposed for a polluted site, particularly a project that will create jobs or other economic development benefits.

Bio-remediation, phytoremediation, and mycoremediation are potential tools for environmental clean up in cases where conventional remediation is not feasible. Bio-remediation, phytoremediation, and mycoremediation allow natural processes to clean up harmful chemicals in the environment. With bioremediation, microscopic "bugs" or microbes that live in soil and groundwater are deployed to eat certain harmful chemicals, such as those found in gasoline and oil spills. When microbes completely digest these chemicals, they change them into water and harmless gases such as carbon dioxide. Phytoremediation and mycoremediation work in much the same way, with plants and fungi, respectively.

Sites where bio-remediation, phytoremediation, and mycoremediation techniques are most typically used include industrial and municipal landfills, agricultural fields, wood treating sites, military bases, fuel storage tank farms, gas stations, army ammunition plants, sewage treatment plants, and mining sites; the use of these techniques in residential areas is much less common. One important research project is being conducted in Portland, Maine. Dr. Samantha Langley-Turnbaugh is using spinach to extract lead from soils in city neighborhoods. The results of this works are to be published this fall.

These alternative remediation techniques take longer to work than conventional brownfield remediation. Plants, microbes, and fungi must be carefully selected and monitored in response to the specific toxins present in the soil and the condition of the soil itself. But research suggests that the following criteria can be used to identify potential sites for bio-remediation, phyto-remediation, or myco-remediation techniques:

- Sites tainted with lower levels of pollutants, contaminants, hazardous substances, petroleum products, or other wastes and debris.
- Sites that do not pose an immediate and significant hazard to adjacent residents.
- Sites that have limited short or long term development potential.
- Can be an interim or permanent solution, depending on the types of contaminants and the remediation period.

Lead is an especially pressing problem in Cleveland's neighborhoods. Vacant sites with exposed soil contribute to airborne lead levels in the city's neighborhoods, especially in the summer months. In many neighborhoods, over 30% of children test positive for lead poisoning each year (Figure 24). This is a public health crisis and a major social and economic challenge. Planting low-mow native turf grasses or other ground covers on vacant sites will reduce the amount of lead particles that become airborne and lessen the extent to which Cleveland residents are exposed to lead. These ground covers may not remediate lead through phyto-extraction, but they may help to contain lead and reduce exposure to airborne lead particles. As a singular treatment method, the usefulness of phytoremediation at a brownfield site in Cleveland is somewhat difficult to determine because there are numerous factors that could influence a contaminants bioavailability and/or the rate a hyperaccumulator can metabolize or degrade the contaminants. A site assessment will be a necessary component to predetermine if phytoremediation would benefit the site. Factors such as contaminant type, soil type, geological and hydrological conditions, weather, and site history will determine whether phytoremediation will be a constructive approach to removing soil contaminants.

FIG 23 Many properties in Cleveland have environmental contaminants

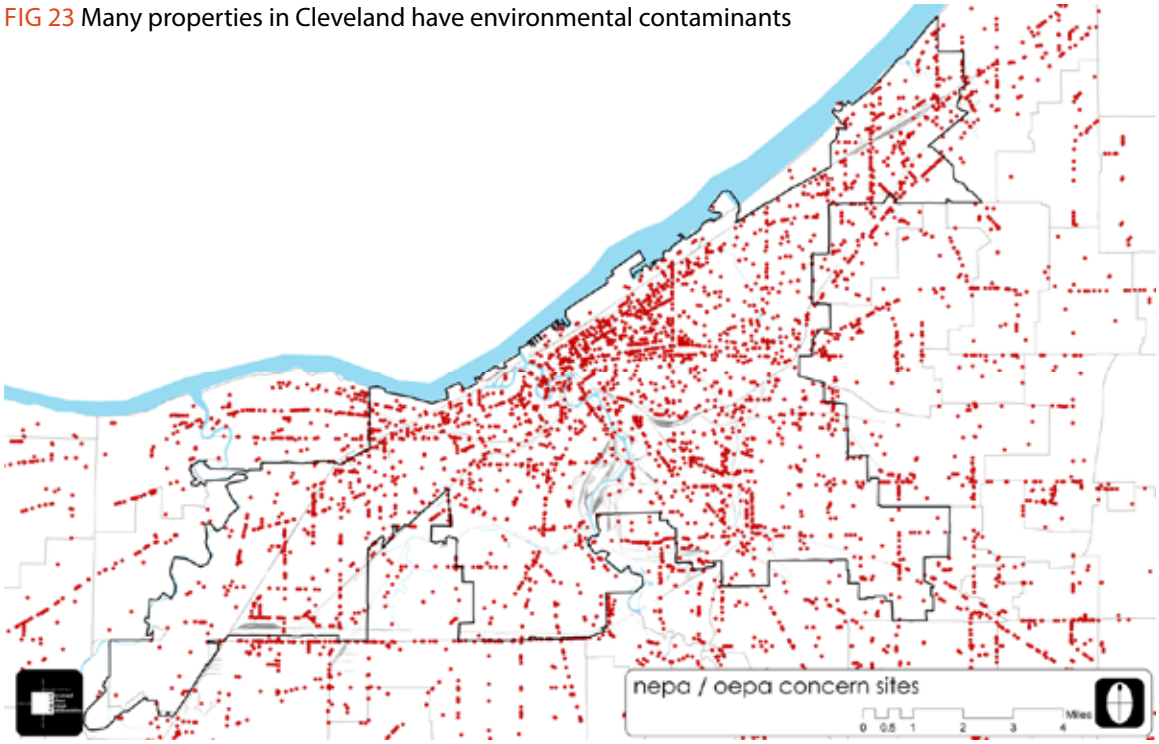
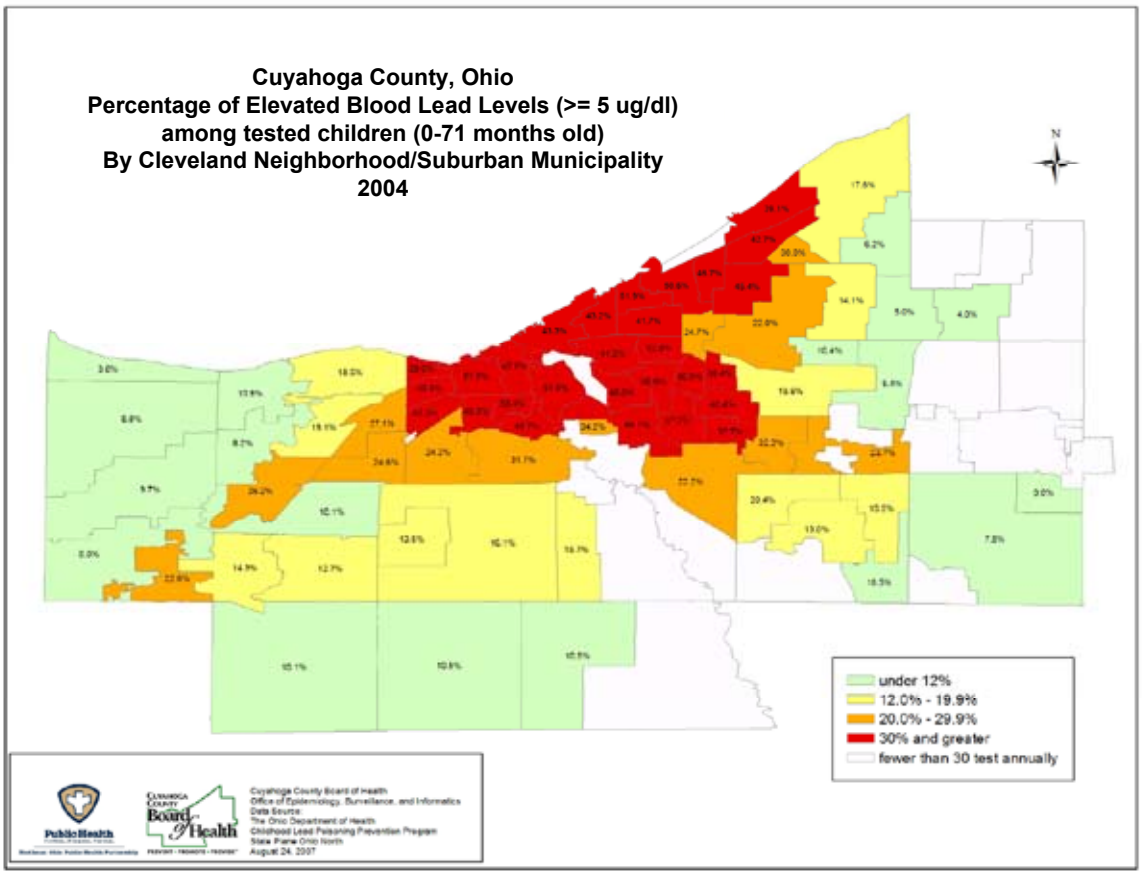


FIG 24 Lead contamination is a problem throughout the city



PRODUCTIVE LANDSCAPES Agriculture and energy generation are two ways that vacant land can be reused to generate an economic return.

Agriculture Access to fresh produce is limited in some parts of the city, as documented by the Cuyahoga County Planning Commission's recent mapping of food deserts–places where fast food restaurants are prevalent and grocery stores are few. Community gardens, market gardens, and urban farms are emerging throughout the city, providing access to affordable locally-grown produce for city residents (Figure 24).

There are more than 160 community gardens in Cleveland that engage 3,600 Cleveland residents. Community gardens increase the consumption of fruits and vegetables and they also bring neighbors together and make neighborhoods safer and more attractive. Vacant land can be used to expand this network of community gardens to provide greater access to healthy food. Seattle developed a benchmark of one community garden for every 2,500 residents. (Seattle Land Use Plan 1994). Based on Cleveland's current population this would equate to about 175 gardens in the city. A better and more ambitious standard would be to establish a community garden within a ½-mile radius of every city resident (Figure 25) or a ¼-mile radius (Figure 26). Criteria for siting community gardens include:

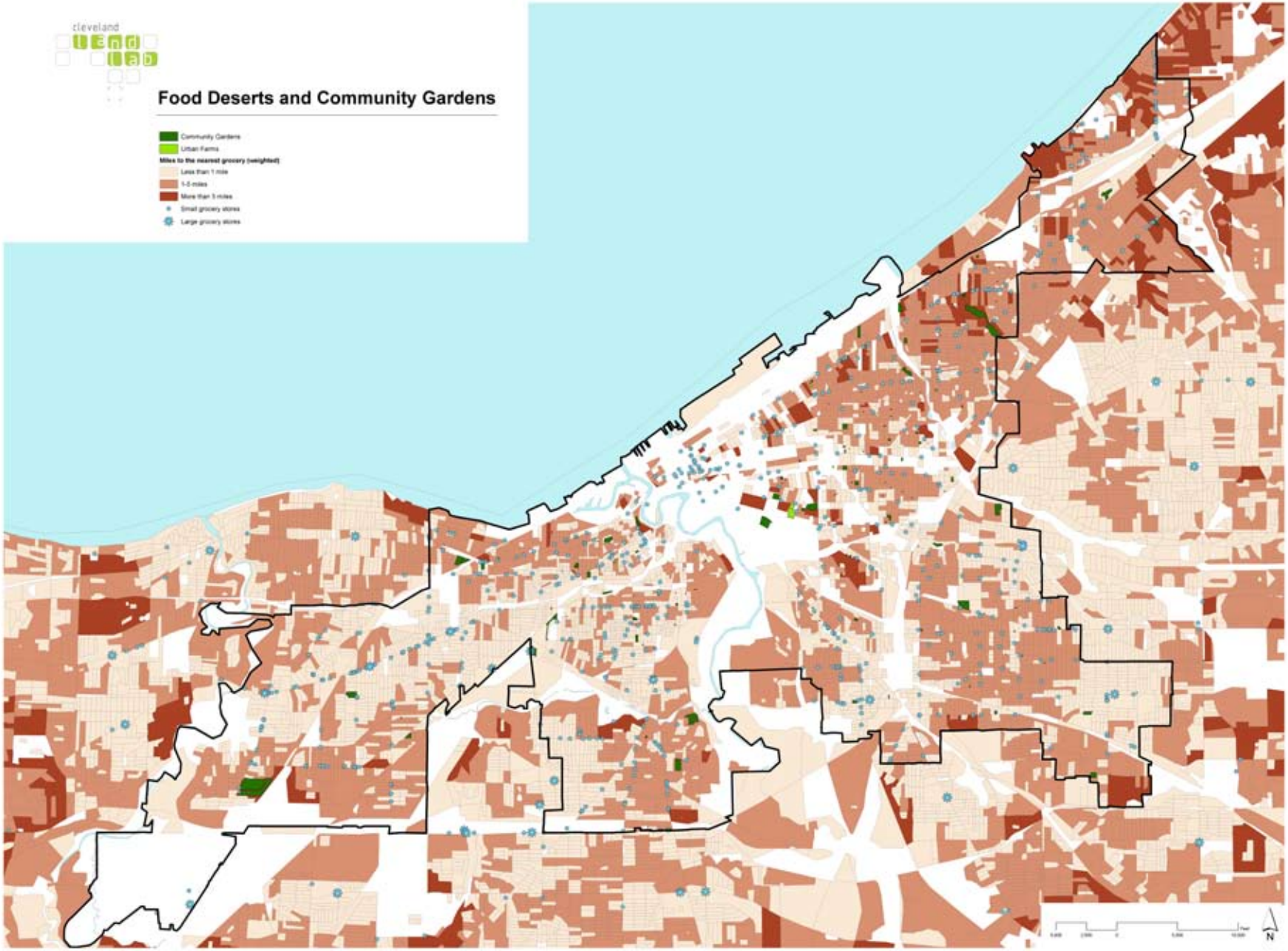
© Maurice Small, 2008

- Level site of approximately 4,000 square feet.
- Large trees or buildings on the north side of the plot.
- Receives 8 hours of full sun each day.
- Close to a fire hydrants for watering (on the same side of the street).
- Free of surface material (i.e. asphalt or gravel).
- Lead levels of less than 400-500 ppm (estimated total lead).
- In a residential neighborhood.
- Community support/local partner; eight to ten gardeners per garden.
- Site with limited development potential.
- Target of one community garden within a ½-mile or a ¼-mile radius of every city resident.
- Priority strategy for establishing community gardens in neighborhoods with residential density of greater than 20 households per acre, and in areas identified as food deserts in the Cuyahoga County Planning Commission's recent (2008) mapping of food availability.

Agriculture can extend beyond community gardens to include market gardens (growing produce to sell) and commercial farming operations. Commercial agriculture is a potential economic development strategy for larger areas of vacancy in the city. Criteria for commercial agriculture include:

- Site of at least one acre.
- Access to irrigation water.
- Large trees or buildings on the north side of the plot.
- Receives 8 hours of full sun each day.
- Soil tests that assess potential contamination based on location and previous use, including lead levels of less than 400-500 ppm (estimated total lead).
- Proximity to other urban agriculture sites to facilitate combined efforts in distribution and marketing and sharing of resources such as tools, water lines and water access, composting, small livestock, etc.
- Site with limited development potential (long-term use).
- Adequate due diligence, such as soil sampling and other environmental investigation activities, that assess potential contamination.

FIG 25 Community gardens and market gardens can expand food choices for residents in urban food deserts.



Note: Approximately 25% of the existing gardens are not for public use; many additional public gardens are planned for 2009.

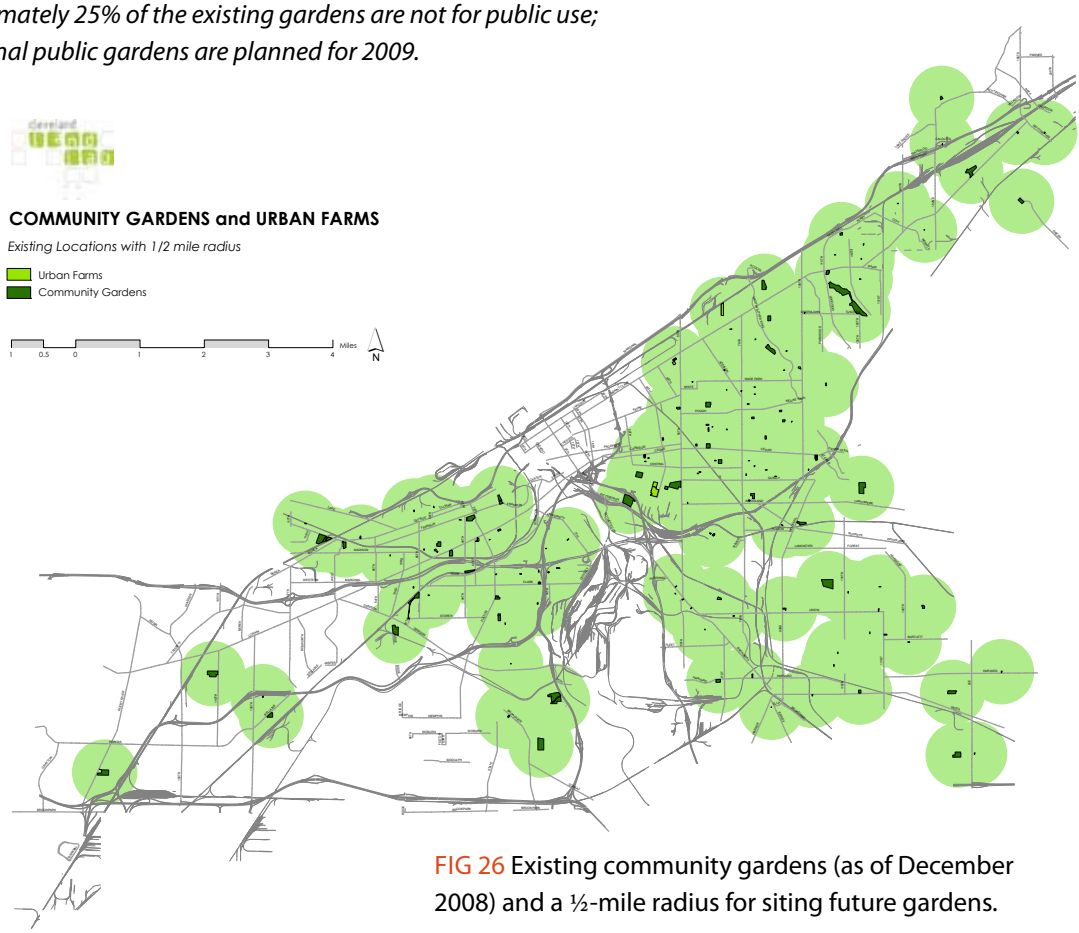


FIG 26 Existing community gardens (as of December 2008) and a ½-mile radius for siting future gardens.

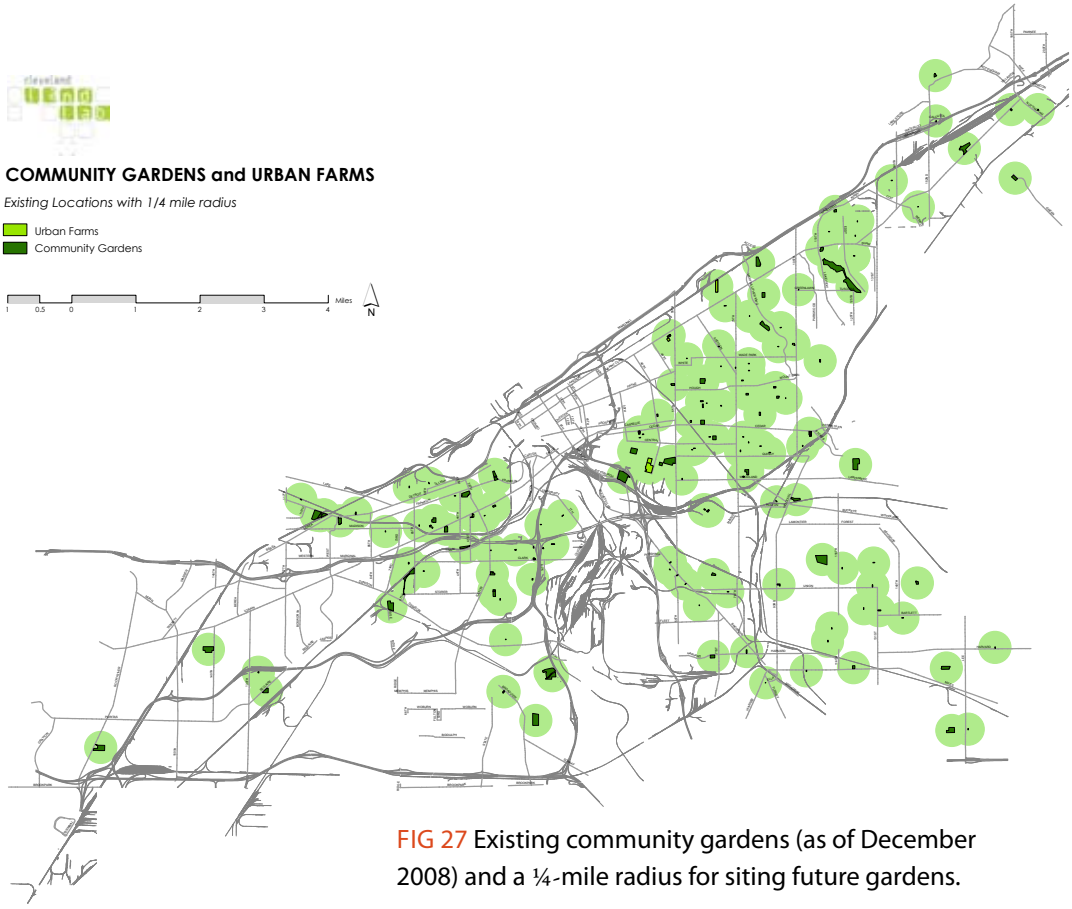


FIG 27 Existing community gardens (as of December 2008) and a ¼-mile radius for siting future gardens.

FIG 28 Blue Pike Farm established on a one-acre vacant lot in the St. Clair-Superior neighborhood *(photo by Carl Skalak)*

FIG 29 Heirloom chickens at Gather 'round Farm in the Ohio City neighborhood *(photo by Uma Kirkwood)*

FIG 30 Switchgrass, corn, or other plant materials can be converted to biodiesel through a commercial or home-based distillation process.

- Site with limited development potential (long-term use).
- Adequate due diligence, such as soil sampling and other environmental investigation activities, that assess potential contamination.

Commercial agriculture opportunities are not limited to food production. Trees and native plants can be grown be grown on vacant sites to supply wholesale or retail plant materials for new and existing development. Currently, all of the region's tree nurseries are located outside of Cuyahoga County and the nearest native plant nursery is in Hiram, Ohio. Growing plant materials on larger vacant sites in the city may prove to be a viable economic development strategy and will increase the availability of native plants that are hardy in urban conditions. Criteria for tree and plant nurseries include:

- Site of at least one acre for a native plant micro-nursery; at least 20 acres are needed for a tree nursery.
- Access to irrigation water.
- Large trees or buildings on the north side of the plot.
- Site with limited development potential (long-term use).
- Soil conditions and sun exposure conducive to the types of plants/ trees that will be grown on the site.

Additionally, there is a growing interest in including bees and chickens at community gardens and commercial agriculture sites. Cleveland City Council recently passed legislation approving this use.

ENERGY GENERATION Vacant properties also offer opportunities for the generation of alternative energy. Solar, wind, geo-thermal, and biofuel technologies can all be incorporated into urban settings where there is ample vacant land and reduced population density. For example, 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.

More research is needed to determine which energy strategies are most viable given Cleveland's dispersed pattern of vacancy, but general criteria for using vacant sites for energy generation include:

GeoThermal

- Underground utilities need to be avoided when establishing sites for geothermal energy production.
- 30 acres is an efficient size for a commercial geothermal energy plant; a smaller, neighborhood-scale plant may be feasible in some locations.
- A vacant residential lot can provide geothermal energy for two adjacent houses.

Wind Turbines

- Minimum one acre site for a residential-scale wind turbine.
- Site must have a minimum annual average wind speed of at least 11-13 mph.
- Proximity to existing transmission lines: a critical issue in keeping costs down in building a wind farm is minimizing the amount of transmission infrastructure that has to be installed availability and access to existing lines should be considered in selecting a site.
- Secure access to land: long term use.
- Is there high raptor activity in the area? Are there endangered or protected species that could be jeopardized by the presence of the facility?
- Is the site's geology suitable and appropriate for industrial development?
- Will noise and aesthetics be issues for the local community?
- Will the turbines obstruct the flight path of local air traffic?

Source: American Wind Energy Association

Ethanol Production

- 50+ acres for commercial-scale farms (including a large-scale processing facility).
- Multiple sites of 2-4 acres for neighborhood energy farms (can share a large-scale processing facility).
- Residential scale farms (on vacant lots); processing can occur in home-based processors, capable of producing 40-80 gallons of biofuel in 8-14 hours.
- Industrial hemp is a high-yielding multi-purpose fuel and fiber crop that has great potential for biomass energy. An acre of hemp yields 10 tons of biomass in four months, enough to make 1,000 gallons of methanol fuel (by pyrolytic distillation), with about 300 pounds of oil from the seed.
- Switchgrass plots produce up to 15 tons of dry biomass per acre, and five- year yields average 11.5 tons—enough to make 1,150 gallons of ethanol per acre each year.

Sources United States Department of Agriculture, National Agricultural Library

Solar Field

- Adaptable to various site sizes – the size of the photovoltaic array and installation method can be tailored to meet the site conditions. A rule of thumb is that a solar array that covers three acres can generate approximately one megawatt of power – enough for 200 homes
- Interim use option – relatively easy to move and install. An otherwise unused site could host a PV array that could later be moved to another location when the site is redeveloped.
- Compatible with diverse end uses – PV can be installed on a variety of commercial, industrial, and residential properties. PV arrays can also be installed directly on the ground on a brown-field without penetrating the surface of the property in situations where the soil should not be disturbed.
- No noise and minimal traffic generated by a PV array; can be sited near residential areas

Source: US Department of Energy

POLICY RECOMMENDATIONS for the RE-USE of VACANT PROPERTIES

LAND USE

- Establish a task force to assess and address barriers to new vacant land reutilization strategies, including zoning, building, and health codes, access to city land and water, etc. *[Cleveland City Planning Commission, Building and Housing Department, Public Service Department, Water Department, Economic Development Department]*
- Adopt land use decision-making mechanism for properties in Cleveland's land bank based on the flow chart in Figure 7, page 9. *[Cleveland City Planning Commission, Community Development Department, Economic Development Department City Council, Mayor's Office]*
- In response to the growing number of foreclosures and demolitions, determine and implement ways to streamline the disposition of properties in the city's land bank and make the process more objective; the goal would be to have a 2-3 month turnaround from when the site comes into the landbank until final disposition. *[Cleveland City Planning Commission, Community Development Department, City Council, Mayor's Office]*
- Encourage the use of hydrological data and soil characteristics as guiding factors for determining future land uses and stormwater management strategies at the city-wide level and in neighborhood master plans. *[Cleveland City Planning Commission]*

DATA

- Develop new ways to classify and geo-code vacant land in the city's GIS system to identify sites that have the strongest potential for real estate development, green space expansion, and the provision of specific ecosystem services, as well as sites that have environmental contaminants. *[Cleveland City Planning Commission, Cleveland Urban Design Collaborative]*
- Develop more detailed, parcel-based mapping of environmental contamination that distinguishes highly contaminated sites from those with lower levels of contamination; include this information in the city's GIS parcel data. *[Cleveland City Planning Commission, City and County Brownfields staff]*
- Develop parcel-level mapping of sites where children have tested positive for elevated blood-lead levels and factor this information into decision-making on building demolition. *[Cleveland Health Department, Building and Housing Department, Cleveland Urban Design Collaborative]*
- Map and document wetland criteria (hydric soils, hydrophytic vegetation, and water regime) and drainage patterns. *[Cleveland Urban Design Collaborative, Cuyahoga Soil and Water Conservation District]*
- Map and document soil properties (HSG, water table, bedrock depth, permeability, moisture content, Ph, erosion, organic matter, and slope) from secondary sources. *[Cleveland Urban Design Collaborative, Cuyahoga Soil and Water Conservation District]*
- Delineate areas of existing vegetative cover throughout the city using recent aerial photographs. *[Cleveland Urban Design Collaborative]*

GREEN INFRASTRUCTURE

- Expand the area devoted to green space and land preservation in the 2020 future land use plan to include riparian areas, headwater protection zones, and elements of the County GreenPrint; promote the use of Green Overlay District Zoning to protect these areas. *[Cleveland City Planning Commission, Cuyahoga County Planning Commission]*

- Identify one or two city-wide green infrastructure initiatives that will link neighborhoods, provide ecosystem and community benefits, and enhance Cleveland's image (e.g. inner "Emerald Necklace" of parks and trails connecting to the Cuyahoga River and the Ohio Canal Towpath Trail). *[Establish task force to explore].*
- Adopt design guidelines and review process to establish minimal areas for ecosystem preservation in riparian and headwaters areas. Determine appropriate method to define terms (setback distance, hydrologic functions, and environmental classifications) and means to administer regulations. *[Cleveland City Planning Commission]*
- Enhance existing lower quality wetlands, preserve existing higher quality wetlands, and create new wetland systems with appropriate vegetated buffers where feasible. *[Northeast Ohio Regional Sewer District, Cleveland Metroparks. Cleveland Water Department, Office of Sustainability]*
- Encourage or mandate the use of bioswales and pervious paving for all new off street parking lots. *[Cleveland City Planning Commission, Department of Engineering and Construction, Community Development Department, Economic Development Department]*
- Encourage the creation of rain gardens on residential properties, especially side yard expansions on vacant lots. *[Cleveland City Planning Commission, Building and Housing Department, Community Development Department]*
- Link green infrastructure projects to the Cleveland Carbon Fund, where appropriate. *[Cleveland Carbon Fund, GreenCityBlueLake Institute]*

URBAN AGRICULTURE

- Provide permanent support for local food production. Prioritize agricultural land uses in the city through the creation of a new land use category for urban agriculture to aid in long-term planning and land security for urban farmers and community gardeners.; revise Urban Garden District zoning classification as appropriate. *[Cleveland City Planning Commission]*
- Establish a goal that every Cleveland resident will be within a minimum ½-mile radius of a community garden or market garden (ideally within a ¼-mile). This will increase local food security, reinforce neighborhood relationships, beautify vacant lots, and promote local entrepreneurship. *[Cleveland City Planning Commission, Ohio State University Extension, Cleveland Botanical Garden, Community Development Corporations]*
- Integrate permanent garden space in model block/neighborhood planning.
- Establish strategies for controlling use and new models for holding land (i.e. re-zone to urban garden district, transfer ownership of land to community land trust, long term land leasing with ability to fence and secure). *[Cleveland City Planning Commission, Community Development Dept., Cleveland Land Bank, Community Development Corporations]*
- Develop policies and practices within the Cleveland Water Department that streamline farmers and gardeners access to water. Establish water rates that incentivize and promote agricultural uses. *[Cleveland Water Department, Community Development Department, Economic Development Department]*
- Explore new ways of bringing water to sites including maximizing the use of rainwater runoff from adjacent building roofs, leaving water lines to properties after demolition of buildings, etc. *[Cleveland Water Department, Community Development Department, Economic Development Department]*
- Explore potential for a municipal composting facility and community composting projects. *[Community Development Department, Cleveland Office of Sustainability, Department of Parks, Recreation and Properties]*

ENERGY GENERATION

- Support the adoption of an Ohio Renewable Energy Portfolio and consider incentivizing the generation and use of renewable energy at the local level. *[Cleveland Office of Sustainability, Cuyahoga County Office of Sustainability, Green Energy Ohio]*
- Support efforts toward energy conservation and optimization, as well as energy production, at a citywide level. *[Cleveland Office of Sustainability]*

PILOT PROJECTS

Pilot projects will be prioritized based on the availability of funding and partnerships for implementation. Benchmarks need to be established for all pilot projects so that benefits can be clearly quantified and monitored. This initial list of pilot projects was developed to test the ideas put forth in this place and determine the most feasible and effective approaches for vacant land reuse. The criteria for pilot projects include:

- Projects that break new ground
- Locations near primary development areas
- Ability to attract funding
- High visibility locations
- Local constituencies and implementation partners

LAND HOLDING STRATEGIES as described in the *Vacant Land Pattern Book*, will be implemented in prime development areas and growth neighborhoods. Land holding strategies will be piloted in prime development areas and other targeted investment areas. Potential partners include all of the community development corporations.

LAND REUSE PROJECTS in urban agriculture, energy generation, bio- and phyto-remediation, stormwater management strategies, and additional recreation/green space will be piloted in low-growth neighborhoods. Potential partners include community development corporations, the Ohio State Extension, the Cleveland Botanical Garden, ParkWorks, the Northeast Ohio Sewer District, and the Cuyahoga Soil and Water Conservation District.

LAND ACQUISITION and MANAGEMENT Develop an organizational model for acquiring and maintaining vacant land and redirecting it for the uses described in the criteria section.

- Pursue land acquisition and management strategies at the watershed-scale, rather than at a neighborhood- or citywide-scale.
- Work with existing local and regional land conservation organizations to develop an urban land conservation mechanism that targets small (<10 acre) sites in the city.
- Work with the City Land Bank and the County Land Bank (when it is established) to acquire strategic parcels for conservation through the foreclosure process.

MOW-TO-OWN PROGRAM Vacant lots can be absorbed into residential neighborhoods by encouraging adjacent property owners to acquire and maintain these sites as an expansion of their own properties. Currently, the city has a program that makes landbank available to adjacent property owners. The city could expand this effort into a Mow-to-Own program in which residents earn the ownership of a neighboring or nearby property in exchange for providing good maintenance of these properties according to city-established standards. A property owner who maintains a property for one year would receive title to the property with the condition that the property continue to be maintained to the same standards. If the property owner fails to maintain the property, ownership would revert to the city's landbank. At high-profile locations in targeted parts of the city, funding could be developed to provide minimal landscaping and fencing in order to make these sites cared for and attractive.

PHYTOREMEDIATION and BIOREMEDIATION for soil restoration and lead containment/remediation of vacant sites. Even if areas must be disturbed later, preserving or establishing vegetation on vacant sites will help restore soil structure and reduce the presence of airborne led in city neighborhoods.

- Vegetation strategies can become part of the city's demolition specifications and/or a separate initiative led by local community development corporations.
- Phytoremediation and bioremediation demonstration sites can be identified from the city's landbank; this would be a site for which remediation funding is not yet available through Clean Ohio, but could be used as an experimental site for phytoremediation strategies.

Potential collaborators include the City of Cleveland Brownfields Coordinator, Cleveland Heath Department, the Ohio State Extension Office, the Greater Cleveland Lead Advisory Council, the Cleveland Botanical Garden, the Cleveland Neighborhood Development Coalition, local community development corporations.

URBAN AGRICULTURE INCUBATOR could provide land and appropriate infrastructure for urban agriculture enterprises. Aspects of this pilot project would include:

- Develop a business plan, resources for start-up, and operating partnerships.
- Identify several sites of at least two-three acres within the city that would be available for long-term use as urban farms and re-zone as an Urban Garden District; conduct environmental assessment to determine whether soil at the preferred site(s) have environmental contaminants that could affect food production.
- Develop appropriate infrastructure at the site and agreements for the management of infrastructure, including access to water, utilities, packing shed/cooler, tool storage, rototiller, security, and soil remediation.
- Once long-term use of land is secured, infrastructure developed, and the project has the support and approval of adjacent land owners, the city, and other stakeholders, ½-acre parcels would be available to agriculture entrepreneurs.

NATIVE PLANT EXPERIMENTAL PLOTS AND NURSERIES /TREE NURSERY Several large-scale public investment projects will occur in the next three to five years, including the extension of the Ohio and Erie Canal Towpath Trail into the City of Cleveland, the creation of Canal Basin Park, and improvements to Wendy Park. Native plant materials in these areas will aid in preserving riparian functions along the Cuyahoga River, improve water quality in the River and Lake Erie, and enhance biodiversity wildlife habitat within the city. Appropriate native plant materials can be expensive and difficult to find. Vacant sites within the city of Cleveland can be used to grow different varieties of plants and to conduct tests to see which plant materials are the most resilient in an urban context. Establishing series of experimental plots will allow a wide range of plant materials to become established prior to transplanting them in permanent locations in public parks and natural areas. Surplus plant materials can also be sold to institutions, residents, and businesses to increase the overall plant diversity of the city. A larger vacant site (20-acres or more) could allow for the creation of a tree nursery.

Several steps are needed to determine the feasibility of a native plant nursery:

- Identify public improvements planned for the next five years
- Calculate the quantity of native plant materials needed for these improvements and determine the acreage that would be needed to cultivate these plant materials.
- Identify land bank lots or other vacant sites that would be most suitable and accessible for plant cultivation.
- Formulate a business plan to determine if it will be financially feasible to establish native plant experimental plots, based on the cost of setting up the experimental plots and cultivating the plant materials,

and well as the revenue that would be generated (or saved) by using these locally grown plant materials for public projects.

- The costs associated with a project of this scale; and
- The environmental, economic, and social benefits of the project.

Potential collaborators include the Cleveland Metroparks, Cleveland Botanical Garden, the Cleveland Municipal School District and South High School's Horticultural Program at Washington Park, and the Cleveland Department of Parks and Recreation, the Democracy Collaborative at the University of Maryland, and the Cleveland City Forester.

NEXT STEPS/IMPLEMENTATION

Moving the ideas of *Re-imagining a More Sustainable Cleveland* forward will require new partnerships and an ongoing commitment to addressing the growing challenge of vacancy in Cleveland. Initial resources for several pilot projects in the first year are available to support this work through Neighborhood Progress, the Surdna Foundation, and the City of Cleveland's federal Neighborhood Stabilization Funds. Additional potential resources include:

- Local and national foundations
- Unexpended NatureWorks funds from the Ohio Department of Natural Resources
- USEPA CARE Program
- Living Cities National Community Development Initiative
- Federal Resources Conservation Service funding through the US Department of Agriculture
- Partnership opportunities with the Northeast Ohio Regional Sewer District, in conjunction with the implementation of a regional stormwater utility
- Research funding from the Northeast Ohio Research Consortium and other sources.
- Private sector partnerships

NPI will work with partner organizations to raise a pool of $1 million for a pilot program which could support up to 100 projects in targeted areas of the city, transforming vacant, blighted land into projects that add value to communities as opposed to being a drain on home values and quality of life. To implement this aggressive agenda, NPI recommends that local community development corporations and other specialized non-profit organizations work with grassroots organizations and individuals to implement the various strategies. These specialized organizations could include: the Cleveland Botanical Garden, Cuyahoga Community Land Trust, Cuyahoga Soil and Water Conservation District, New Agrarian Center, North East Ohio Regional Sewer District, OSU Extension, ParkWorks, Shaker Lakes Nature Center, and the Trust for Public Land.

"We know what recovery looks like. We've done it before and we'll do it again" - Councilman Anthony Brancatelli, Ward 12, City of Cleveland. For the past 20 years, Cleveland has been a national leader in community development and can become a national leader in the reutilization vacant land for productive use. The principles and projects described in this report are the beginning of a new way of thinking about development and conservation across the city. The resources and expertise are now available to support the city's recovery and transform Cleveland into an innovative, sustainable, and radiant city.

For more information on implementation of pilot projects and next steps on policy recommendations, please contact Bobbi Reichtell at Neighborhood Progress: blr@neighborhoodhoodprogress.org or 216.830.2770.