

RE-IMAGINING a [Greater] Cleveland



ACTION PLAN for
Vacant Land Reclamation

RE-IMAGINING a [GREATER] CLEVELAND
August 2011



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OVERVIEW

INTRODUCTION

In 2008-2009, the *Re-imagining a More Sustainable Cleveland* initiative identified a series of principles for the strategic reuse of vacant urban land. These principles encompass three categories of vacant land reuse:

- (1) *Stabilization and holding strategies* for areas of the city where new development is anticipated;
- (2) *Green space expansion and green infrastructure* to improve ecological systems, increase access to parks and amenities, and improve public health; and
- (3) *Economically productive uses*, such as urban agriculture and the generation of renewable energy, as a means to derive an economic benefit from vacant land.

To test the *Re-imagining* principles, the City of Cleveland and Neighborhood Progress, Inc. funded 56 vacant land pilot projects throughout Cleveland, chosen through a competitive, grassroots-driven process. The implementation of these projects occurred in conjunction with neighborhood stakeholders and two non-profit partners, ParkWorks and the Ohio State University Extension. Pilot projects include community gardens and small-scale farming operations, native landscapes and pocket parks, soil remediation efforts, and stormwater management projects. The pilot projects provided an important venue for community engagement and they demonstrated the benefits of vacant land reuse at the neighborhood scale. The pilot projects also provide a means to test various alternatives for reusing vacant sites. The most successful and effective alternatives can then be scaled up in an effort to address the city's growing inventory of vacant property.

In 2010, the *Re-imagining* effort was expanded beyond city limits to include inner-ring suburbs in Cuyahoga County where foreclosures, demolitions, and vacant land are a growing problem. The new initiative, *Re-imagining a [Greater] Cleveland* delineates the most suitable locations for specific vacant land reuse strategies. This report includes maps of areas in the city and county where vacant land can be used most effectively for green space expansion, agriculture, stormwater management, the restoration of urban watersheds, and the generation of renewable energy. At the city-wide scale, the Cleveland City Planning Commission convened eight vacant land working groups and developed a series of overlay maps to identify priority areas for sustainable redevelopment, as well as locations where vacant land stabilization is a top priority. Many of the city's and county's maps are included in this document.

Re-imagining a [Greater] Cleveland also includes proposals for a range of large scale vacant land signature projects. The initial 56 *Re-imagining* pilot projects have had a powerful impact the neighborhoods where they are located. The *Re-imagining* signature projects are intended address issues at the citywide and regional scale, and set the stage for on-going land reclamation efforts across the city and county.

GOALS of RE-IMAGINING a [GREATER] CLEVELAND

Re-imagining a [Greater] Cleveland is a regional vacant land action plan. It is both a pragmatic, data-driven strategy for the management and reuse of vacant properties and a long-range effort to integrate natural systems into urban redevelopment efforts. Expanding on the work of *Re-imagining a More Sustainable Cleveland*, *Re-imagining a [Greater] Cleveland* seeks to:

- stabilize a weak and dysfunctional real estate market
- create new opportunities for economic development
- restore damaged urban ecosystems, and
- improve the health and well-being of city and county residents.

The fundamental goal of this work is to transform the growing inventory of vacant land into a regional asset, and to create a more sustainable framework for future development.

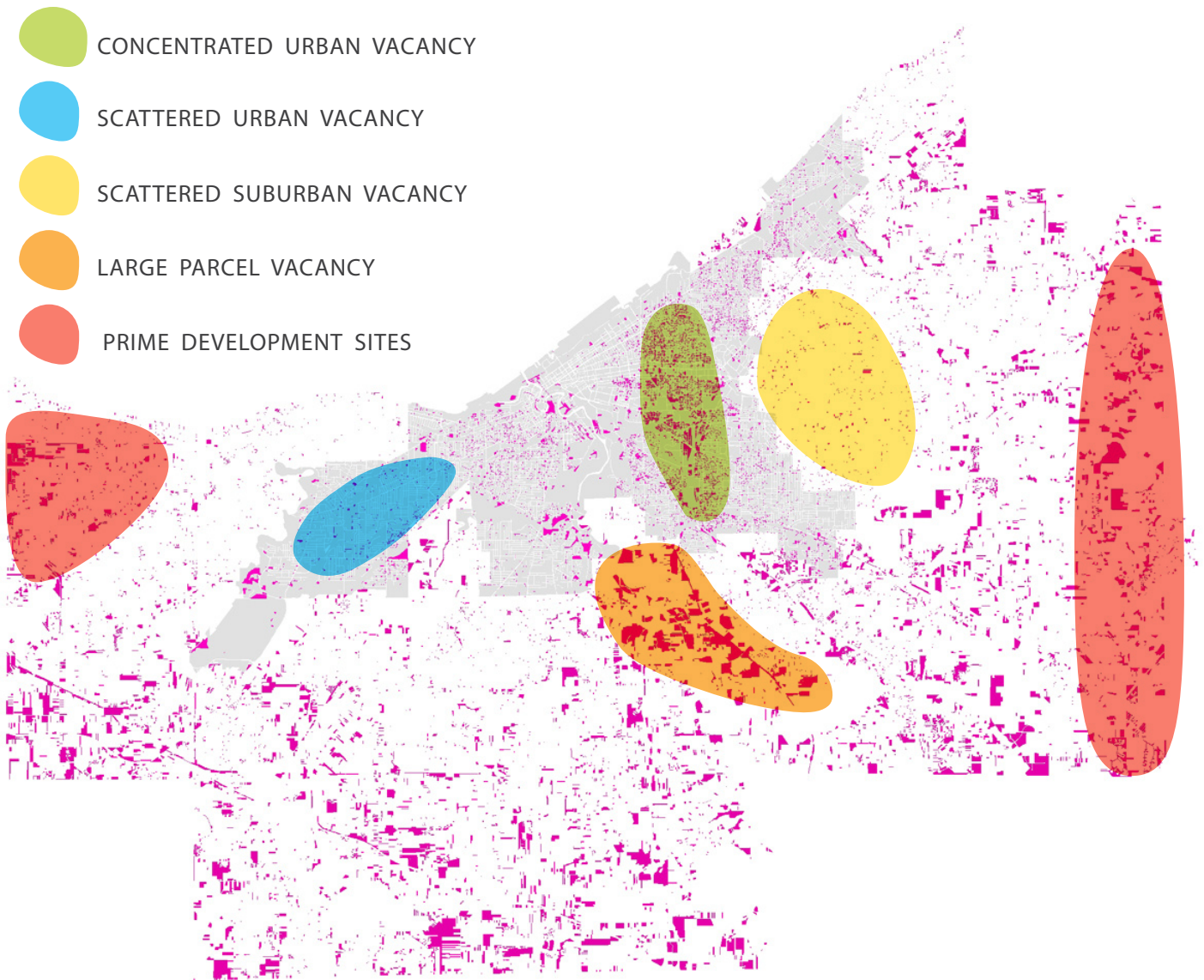
PATTERNS of VACANCY

As of November of 2010, Cleveland had approximately 3,570 acres of vacant land out of a total city area of 41,963 acres—an 8.5% vacancy rate. At the same time, Cuyahoga County (excluding the city of Cleveland) had 22,952 acres of vacant land out of a total county area of 262,216 acres—an 8.8% vacancy rate. Although the vacancy rate is slightly higher in the county than in the city, the characteristics of vacant land change considerably between Cleveland's east side neighborhoods, the city's west side neighborhoods, first-ring suburbs, and outer suburban areas. In general terms, vacant sites can be differentiated as follows:

- (1) *Concentrated urban vacancy*: areas within the city of Cleveland (most prevalent on the east side of the city) with high concentrations of vacant buildings/land and depressed property values.
- (2) *Scattered urban vacancy*: areas within the city of Cleveland where vacant residential lots are interspersed with occupied housing with stable or gradually declining property values.
- (3) *Scattered suburban vacancy*: dispersed pattern of vacancy, increasingly occurring in first-ring suburbs. Characterized by growing numbers of vacant buildings, but fewer demolitions/vacant sites than comparable neighborhoods in the city of Cleveland.
- (4) *Large-parcel vacancy*: concentrations of vacant commercial and/or industrial sites, typically found along industrial rail corridors in the city and along commercial streets in some of the first-ring suburbs, particularly the suburbs immediately south of Cleveland.
- (5) *Prime development sites*: including never developed land and infill residential sites at the periphery of the county.

Scattered vacancy can be addressed through small scale interventions like pocket parks and community gardens, along with lot consolidations that will incrementally reduce neighborhood density. The initial 56 pilot projects from the *Re-imagining a More Sustainable Cleveland* initiative primarily address the scattered vacancy condition.

Concentrated, large-scale vacancy includes areas with moderate to high development potential such as the land bank hold areas where the city of Cleveland is assembling land for future development. Here, the focus is on stabilization efforts to make these areas look clean, safe, and ready for development. Large-scale vacancy also includes areas with very low development potential—vast tracts of land for which there is little development demand and no apparent use in the foreseeable future. The *Re-imagining a [Greater] Cleveland* signature projects are intended for these areas.



Vacancy conditions change daily, especially in the City of Cleveland where extensive demolition efforts are underway. There is an on-going need to evaluate vacant properties and track changes across the county using a consistent and regularly updated set of indicators, including:

- Vacant sites, with differentiation among categories of vacancy and property values
- Recent demolitions
- Vacant/distressed/condemned buildings
- Short-term/transitional vacancy
- City and county land bank properties (buildings and sites)

The NEO CANDO web app and the Cuyahoga Land Reutilization Corporation's parcel-level mapping tool capture many of these indicators. On-going data collection in the city and the suburbs is necessary to allow fluctuations and trends in vacancy to be tracked across the county.

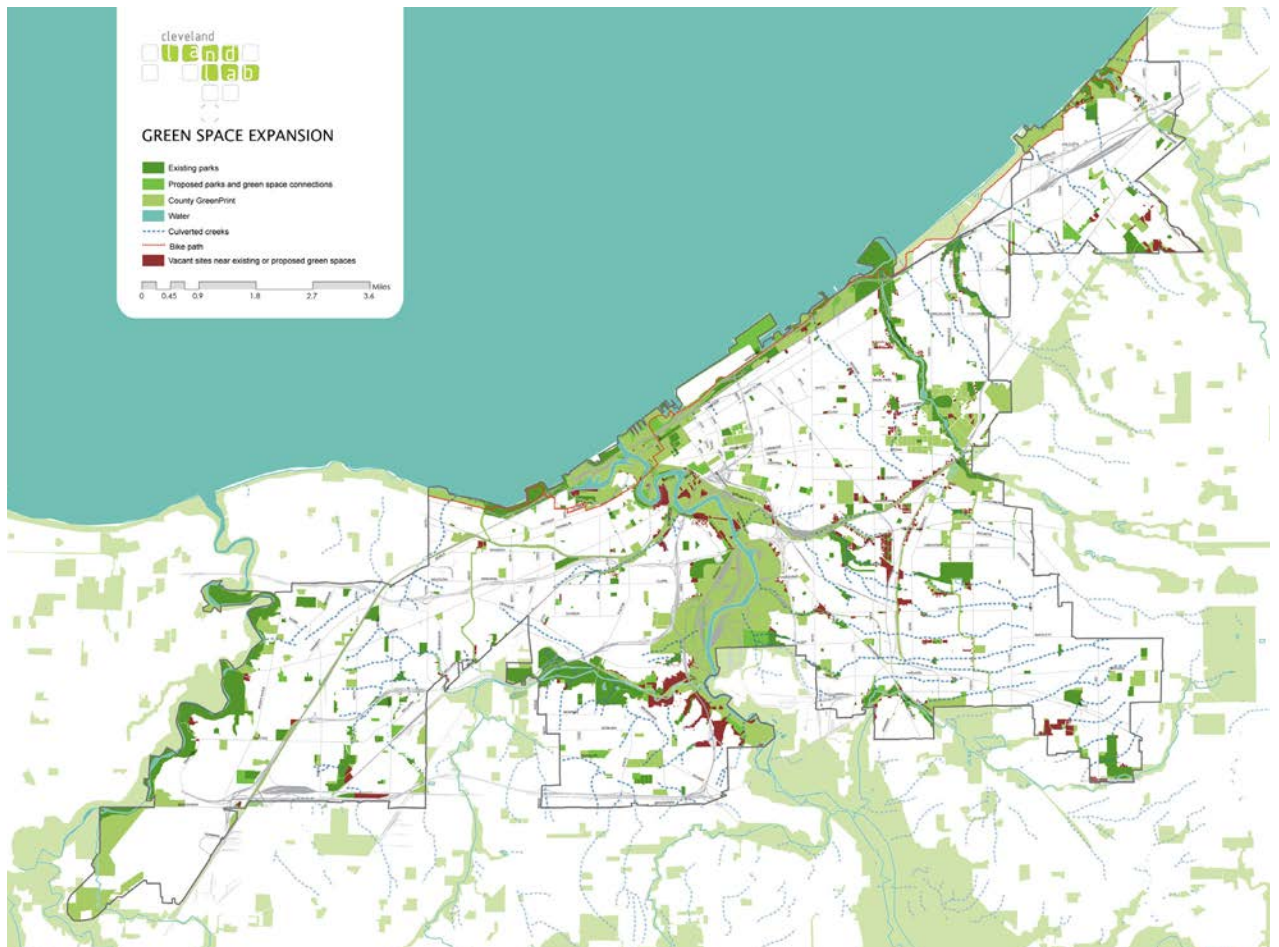
PRIORITY AREAS for VACANT LAND USES

The amount of vacant land in the City of Cleveland and in some parts of Cuyahoga County is increasing. Short-term, long-term, and permanent uses for this land need to be determined based on clear strategies and criteria. This report identifies suitable locations in the city and county for alternative land uses including green space expansion, agriculture, watershed restoration and stormwater management, and the generation of renewable energy. At the city-wide scale, priority areas for sustainable redevelopment are also identified, as well as areas where vacant land stabilization and remediation are a priority.

GREEN SPACE EXPANSION

Vacant land can be used strategically to expand, enhance, and connect existing parks and green spaces in the City of Cleveland and in Cuyahoga County. Vacant land can also be used to create new public green spaces, particularly in neighborhoods that are under-served in terms of existing parks or where there is an institutional partner or community organization willing to assume responsibility for programming and maintenance.

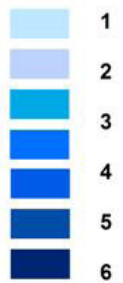
In the initial *Re-imagining a More Sustainable Cleveland* initiative, vacant land was mapped based on proximity to existing and proposed parks and green spaces, as well as sites that could provide connections between green spaces. These sites, shown in red on the map below, represent potential opportunities for green space expansion.



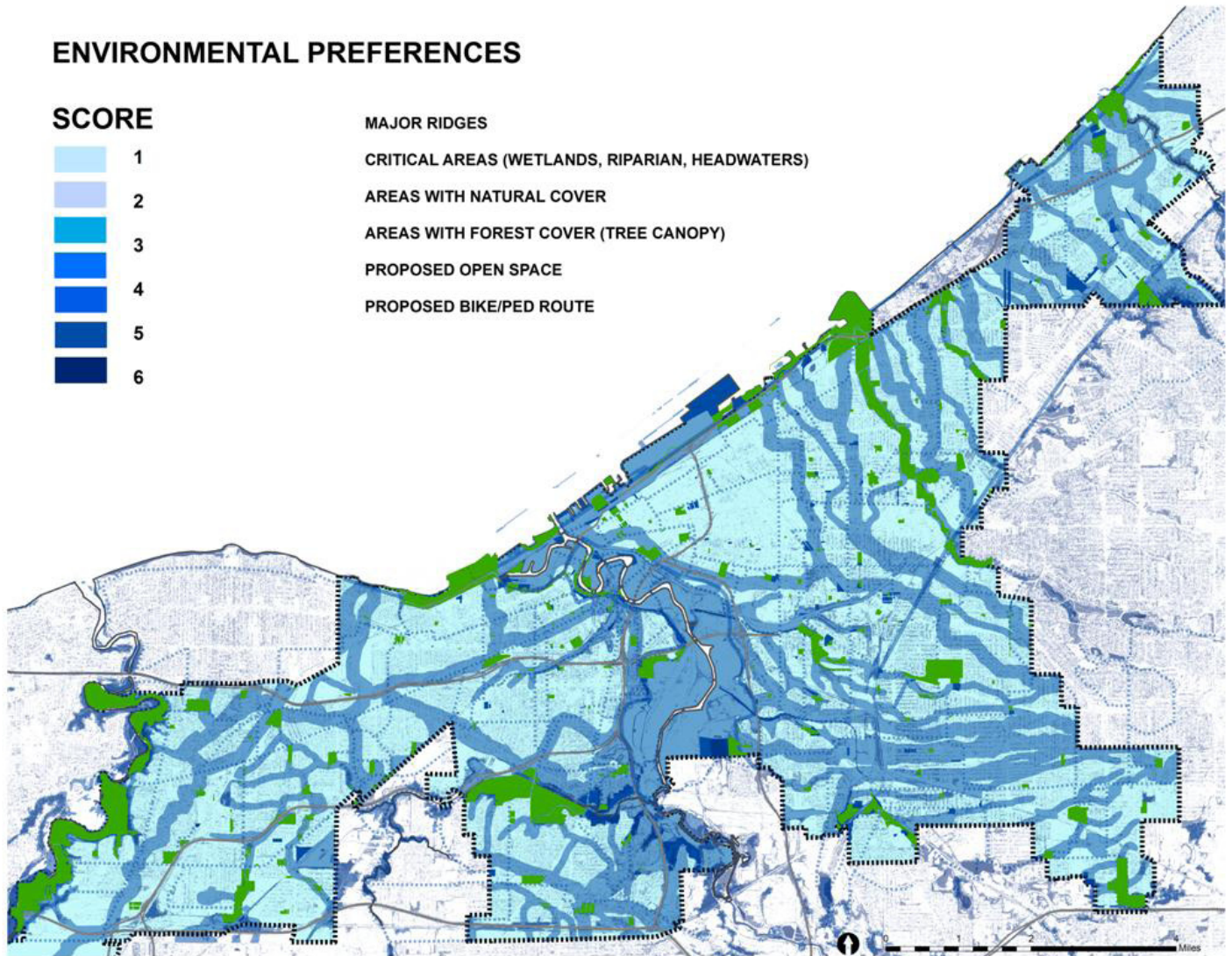
One of the Cleveland City Planning Commission’s vacant land working groups developed criteria for green space expansion that includes land along major ridges, ecologically critical areas, and areas with natural cover and intact tree canopy, along with sites that have been proposed for open spaces and bicycle/ pedestrian routes. The darkest blue areas on the map below indicate the highest priority areas for dedicating vacant land for green space expansion.

ENVIRONMENTAL PREFERENCES

SCORE



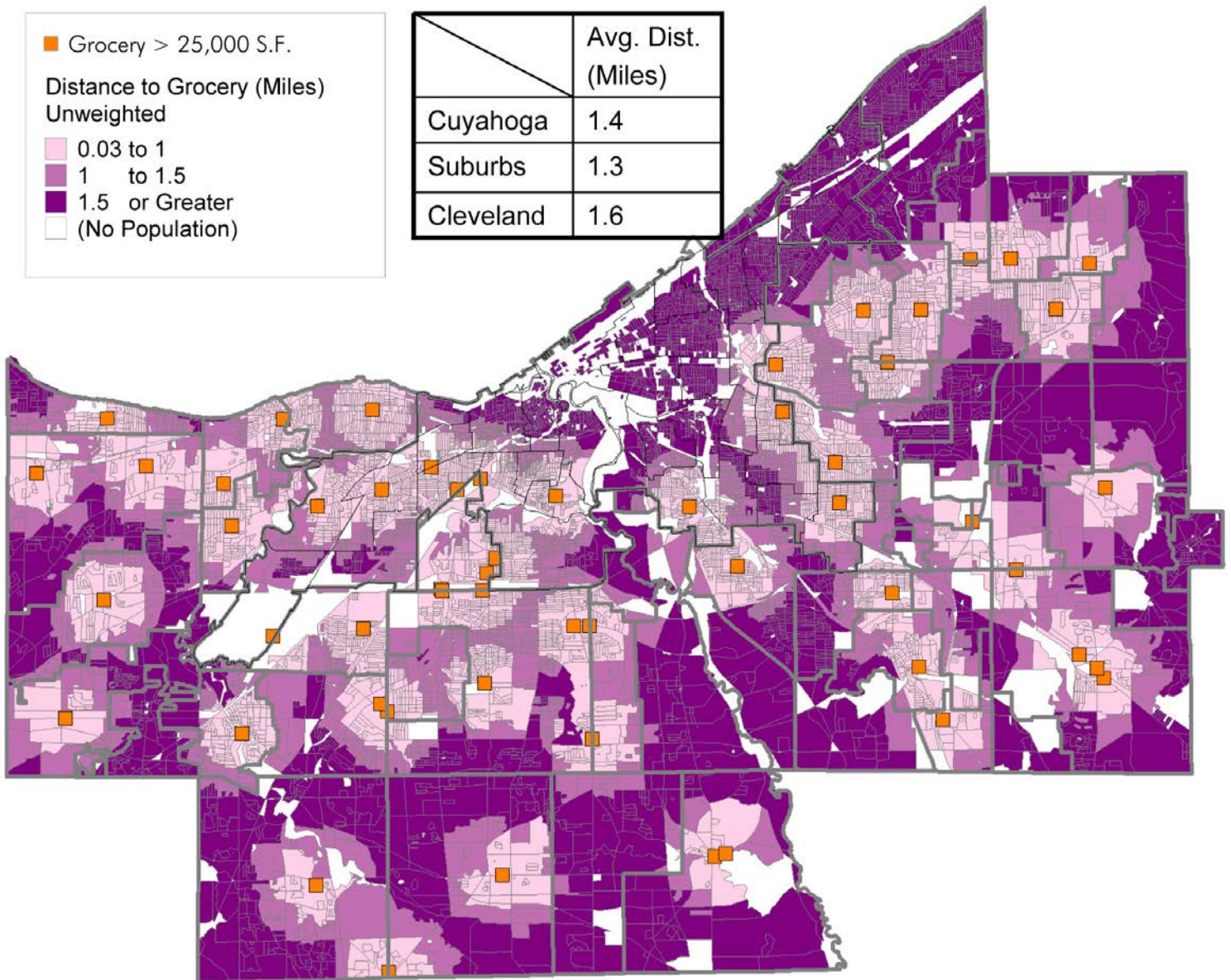
- MAJOR RIDGES
- CRITICAL AREAS (WETLANDS, RIPARIAN, HEADWATERS)
- AREAS WITH NATURAL COVER
- AREAS WITH FOREST COVER (TREE CANOPY)
- PROPOSED OPEN SPACE
- PROPOSED BIKE/PED ROUTE



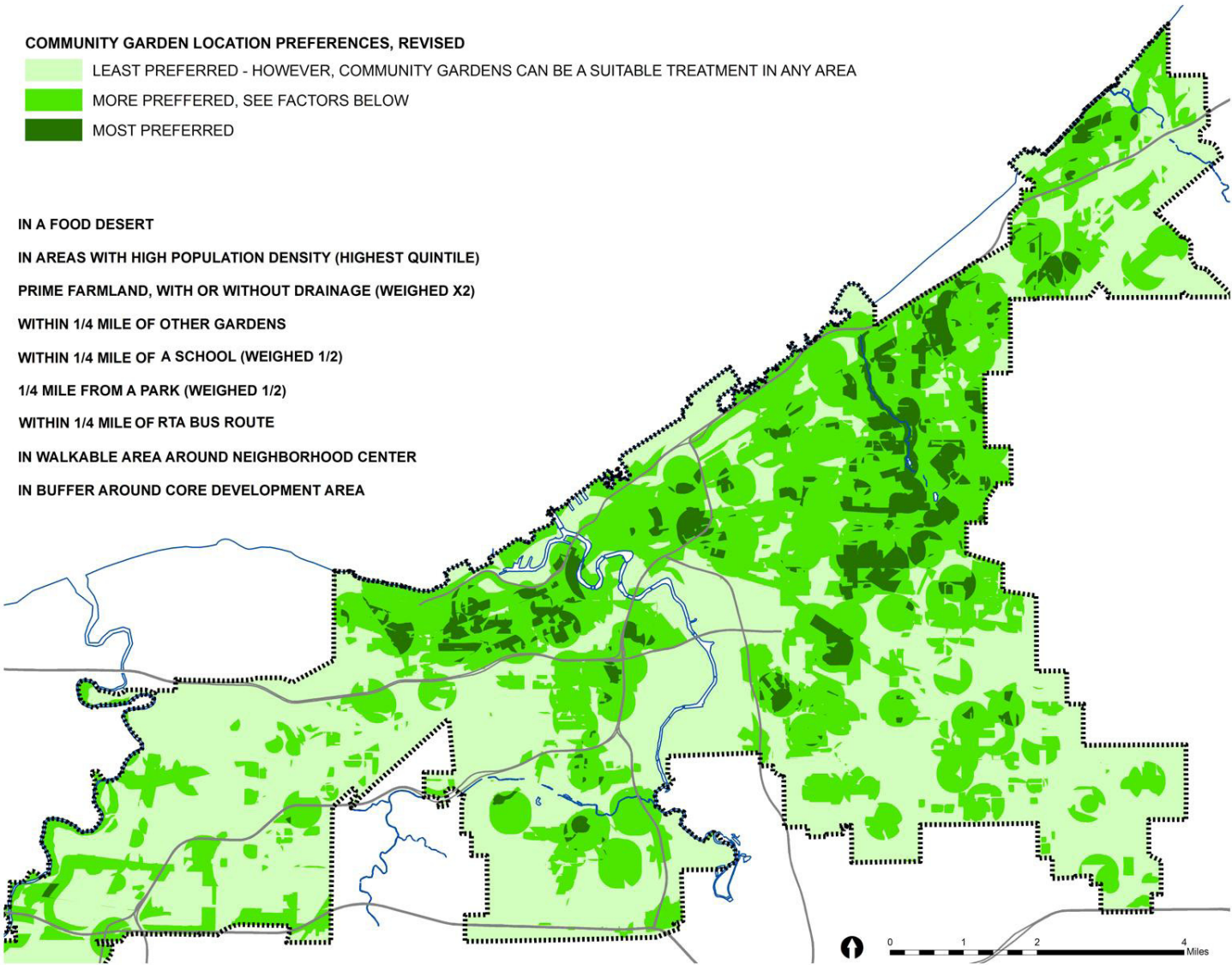
The Cuyahoga County Planning Commission is updating the county GreenPrint, a comprehensive vision for green space protection and restoration within the county, first adopted in 2002. The updated GreenPrint puts a greater focus on ecosystem functions and more directly addresses vacant land reclamation as part of the county-wide green space network. Once the GreenPrint update is complete, city and county land bank sites (and other vacant properties in the city and county) can be assessed for their potential value as part of an expanded green space network.

AGRICULTURE

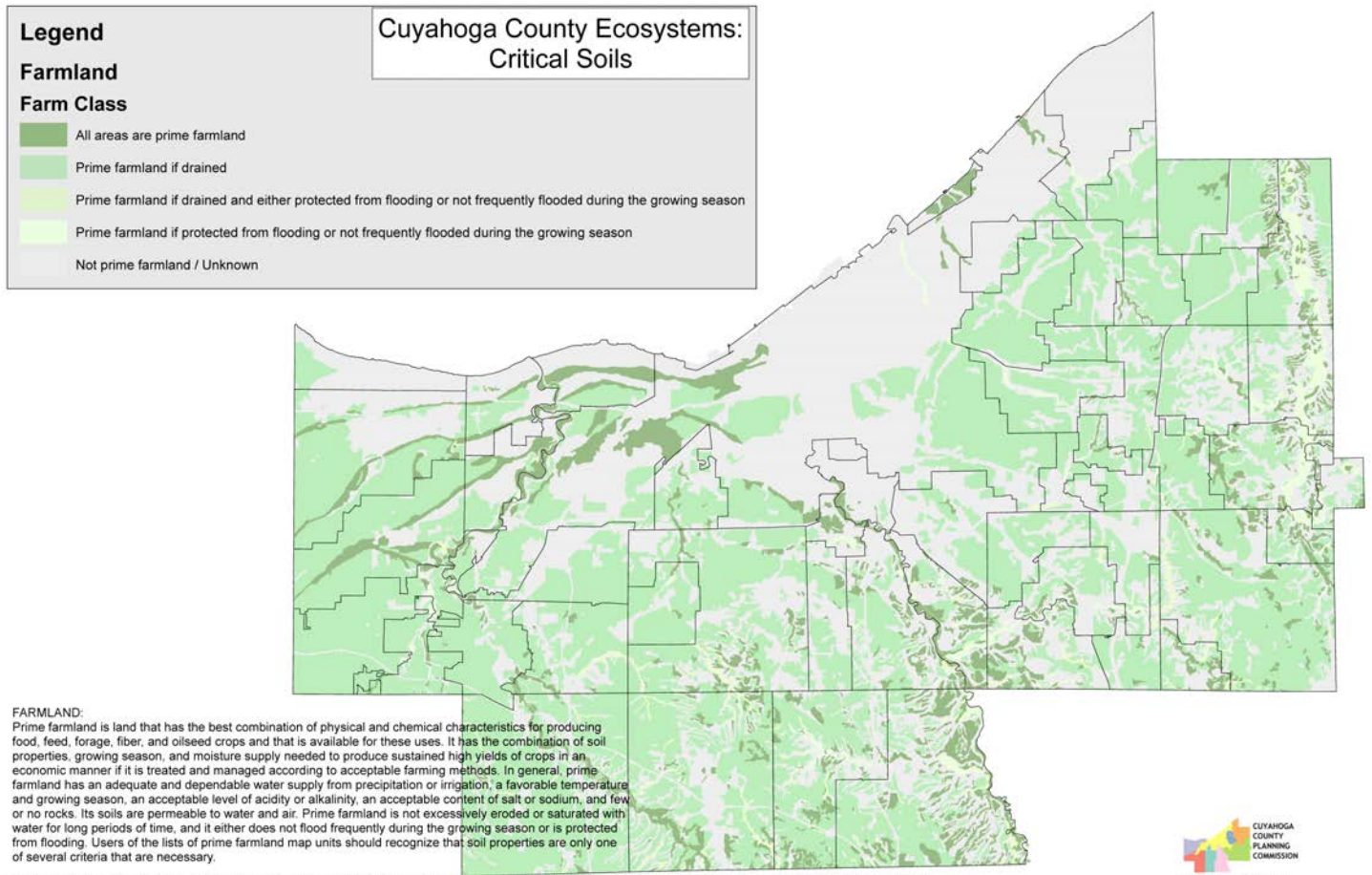
Growing food on vacant sites can help to eradicate hunger in Cleveland and Cuyahoga County. According to the 2009 American Community Survey, Cleveland is the second poorest major city in the US, with one in three city residents living in poverty. 51.3% of Cleveland’s children are poor, as are 18.6% of the county’s residents. Poverty correlates with chronic hunger. Also, public health disparities are exacerbated in neighborhoods that lack grocery stores. The Cleveland-Cuyahoga Food Policy Coalition has mapped food deserts, where grocery stores are scarce and residents have limited access to fresh, healthy food. The darkest areas on the map below represent neighborhoods where residents have the least access to healthy food.



Given the prevalence of food deserts in Cleveland, there is growing interest in and support for urban agriculture in the city. From a pragmatic standpoint, scattered sites in an urban setting are not likely to produce large economic returns from agricultural uses, but community gardens and urban farms play an essential role in increasing access to healthy food. The initial *Re-imagining* effort set a goal of establishing a community garden, market garden, or urban farm within walking distance (a quarter-mile radius) of every city resident. The Cleveland City Planning Commission's Urban Agriculture Working Group developed a more detailed set of criteria for determining the most suitable locations in the city for food production, which take into account soil conditions and social factors such as proximity to schools and transit. High-priority locations are shown in dark green on the map below.



To further delineate the potential for local food production, the County Planning Commission mapped critical soils to identify areas of prime farmland in the city and county. Prime farmland is defined as well drained soils with suitable soil characteristics and access to water for irrigation. It is important to note that sites mapped as “prime farmlands” in previously developed areas will require fieldwork and soil testing, since contamination and buried debris may limit the suitability of any given site for food production.



Vacant land can accommodate a variety of agricultural operations, including small gardens, large farms, green houses, and agriculture incubators. These agricultural uses can be established on strategically selected vacant sites, along with community kitchens and other food processing facilities to add value and profitability to urban agriculture efforts. Patterns of agricultural production can be integrated into urban neighborhoods to feed the hungry and create compelling places that support urban redevelopment efforts.

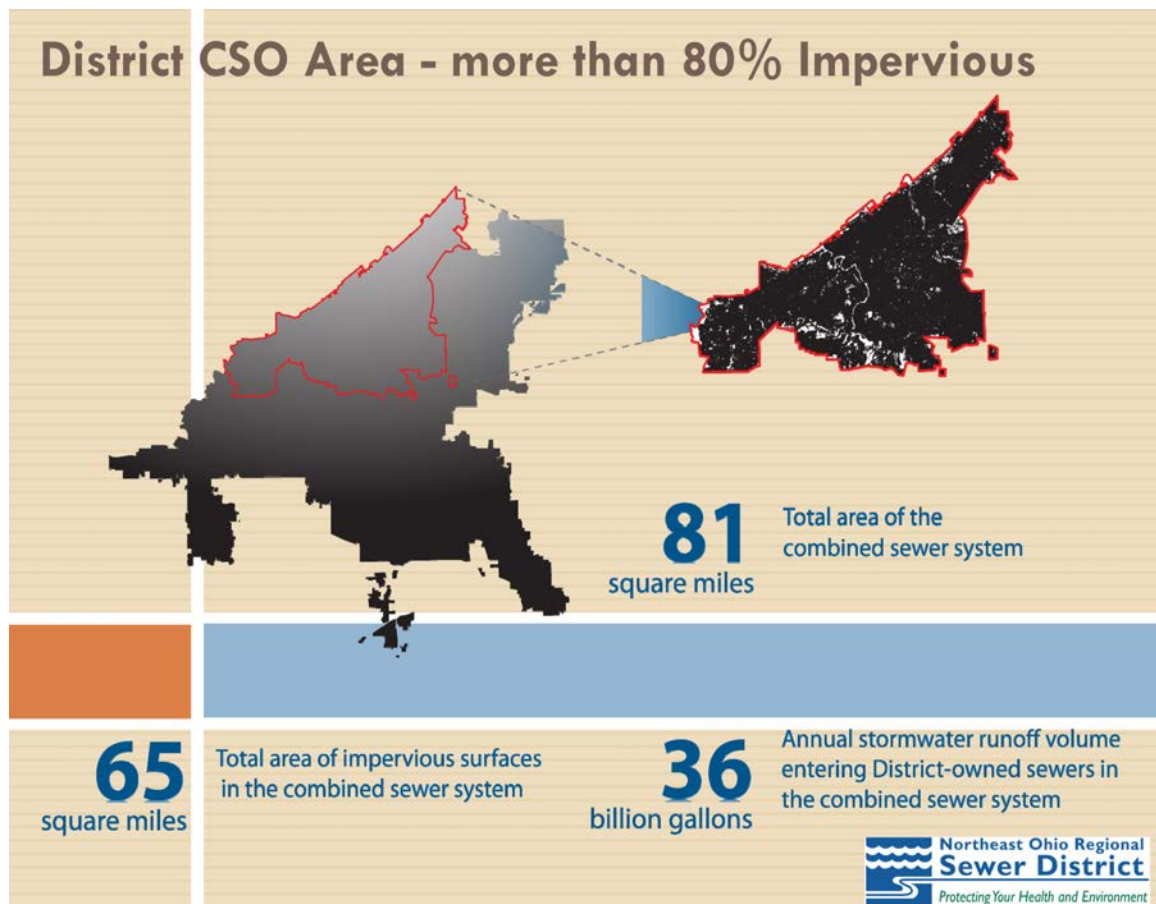
As population in the city stabilizes and development demand in the county begins to increase, vacant land devoted to food production could be reconfigured into a more compact footprint. For example, greenhouses and vertical farming can provide a similar output as more land-intensive field crops. As land values increase, compact agriculture would enable food production to coexist with more traditional urban development. Flexibility is the key factor in vacant land reuse. Strategic vacant land management helps to build resiliency into transitional neighborhoods.

STORMWATER MANAGEMENT/WATERSHED RESTORATION

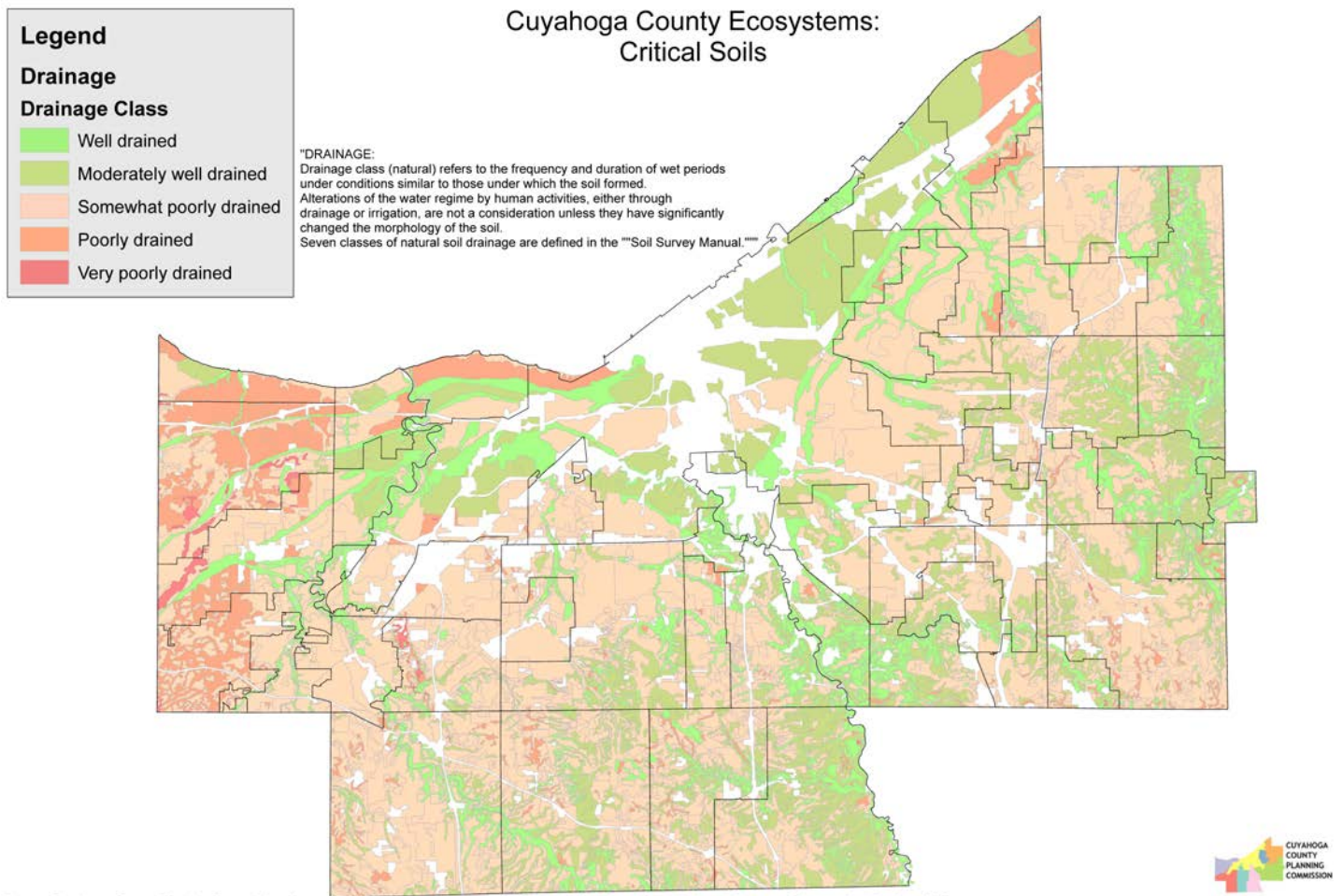
Vacant sites offer opportunities for stormwater collection and infiltration to restore urban watersheds. The reuse of vacant sites as green infrastructure can improve water quality and reduce the number of combined sewer overflow (CSO) incidents that occur when storm sewers overflow into sanitary sewers and release untreated sewage into Lake Erie. The CSO area (where stormwater and sanitary sewer pipes are combined in the same trench) is primarily in the City of Cleveland, extending slightly into the inner-ring suburbs.

CSOs result in the frequent release of untreated sewage into Lake Erie, in a violation of the Federal Clean Water Act. The CSO problem will cost the region more than \$3 billion to correct. A systemic approach to using vacant land for stormwater management can help address the CSO issue, aligning vacant land reuse strategies with the technical and financial resources of the Northeast Ohio Regional Sewer District (NEORS D).

In the CSO area, 80% of the land is impervious—consisting of roads, parking lots, sidewalks, rooftops, and other surfaces where rainwater can't be absorbed naturally into the ground. Removing unneeded pavement and demolishing vacant buildings in specific locations within the CSO area can reduce overflow volumes. NEORS D is currently identifying priority areas for capturing stormwater before it reaches the sewer system in order to achieve a direct and measurable reduction in CSO occurrences. Even in non-CSO areas, reducing the percentage of impervious surfaces will help to improve water quality in Lake Erie, the Cuyahoga River, and their tributaries.



Vacant land can play a valuable role in stormwater management and watershed restoration. Vacant sites with well-drained soil can be graded and landscaped to collect stormwater from roofs, sidewalks, and driveways and allow it to be absorbed into the ground, rather than directed into the sewer system. The soil in some parts of the city and county has a greater inherent capacity for infiltration. The Cuyahoga County Planning Commission has mapped areas with sandy, well-drained soils (green areas shown on map below). Vacant land in these areas is more suitable for stormwater capture and infiltration than other parts of the county, where soils do not absorb water as rapidly. NEORS is currently mapping these conditions in greater detail.



Source: Cuyahoga County Planning Commission, November 2010; Adapted from Web Soil Survey of Cuyahoga County, Natural Resource Conservation Service, 2010.

Vacant land can be used to reforest headwaters areas in the city and to establish riparian setbacks for creeks and streams in some suburban locations. In Cleveland and parts of the inner-ring, many creeks and streams were contained in culverts in an earlier era when urban growth pressures lead to this erasure of indigenous waterways. In the present climate of weak development demand, there is an unprecedented opportunity to restore the region's urban watersheds by assembling vacant sites that align with buried water ways and limit future development in these areas.

From an ecosystems perspective, it was never a good idea to contain streams in culverts and build on top of them. As inventories in the city and county land banks continue to grow, sites that coincide with buried waterways could be set aside, one parcel at a time. In some cases, these sites could be used for stream restoration. However, restoring (or “daylighting”) streams is a vastly expensive proposition. As such, it is unlikely that all of greater Cleveland’s culverted waterways will ever be restored to a wholly natural condition. But it may be possible to assemble vacant properties along the actual (or approximate) paths of buried creeks and streams and re-establish riparian vegetation on these properties. The culverts would remain intact for the foreseeable future. But these strands of vegetation that emerge through vacant land assembly would enable rainwater to flow along more natural paths across the surface of the ground, allowing for water to be absorbed into the soil, rather than diverted into the storm sewer system. These vacant sites would not be manicured green spaces or engineered stormwater features. Instead, they would be left in a slightly wild and natural state to support the restoration of ecological functions. There are several benefits to doing this:

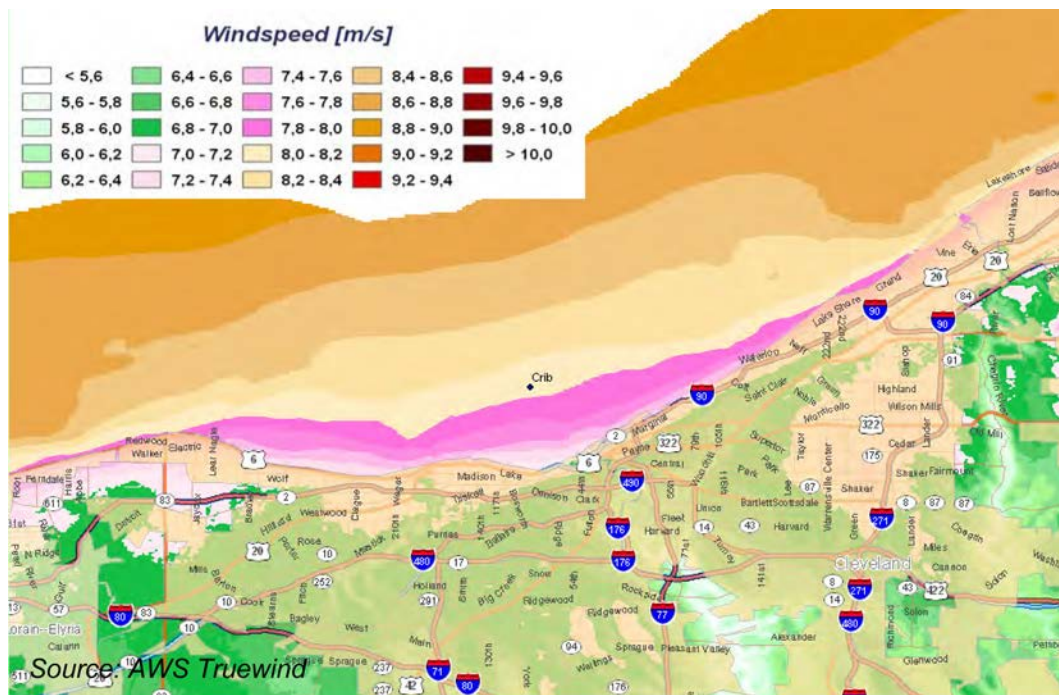
- By preserving the land above culverted streams, the possibilities remain open for future daylighting projects, if culverts eventually fail or new resources become available for stream restoration.
- The paths of buried waterways intersect with parks, schools, and many other amenities, and they all lead to the Cuyahoga River and Lake Erie. Natural greenways above culverted streams would allow for new bike and pedestrian connections, resulting in a more coherent and accessible green space network for the city, with links to the suburbs beyond.
- Natural greenways increase biodiversity, wildlife habitat, and access to nature in urban neighborhoods.



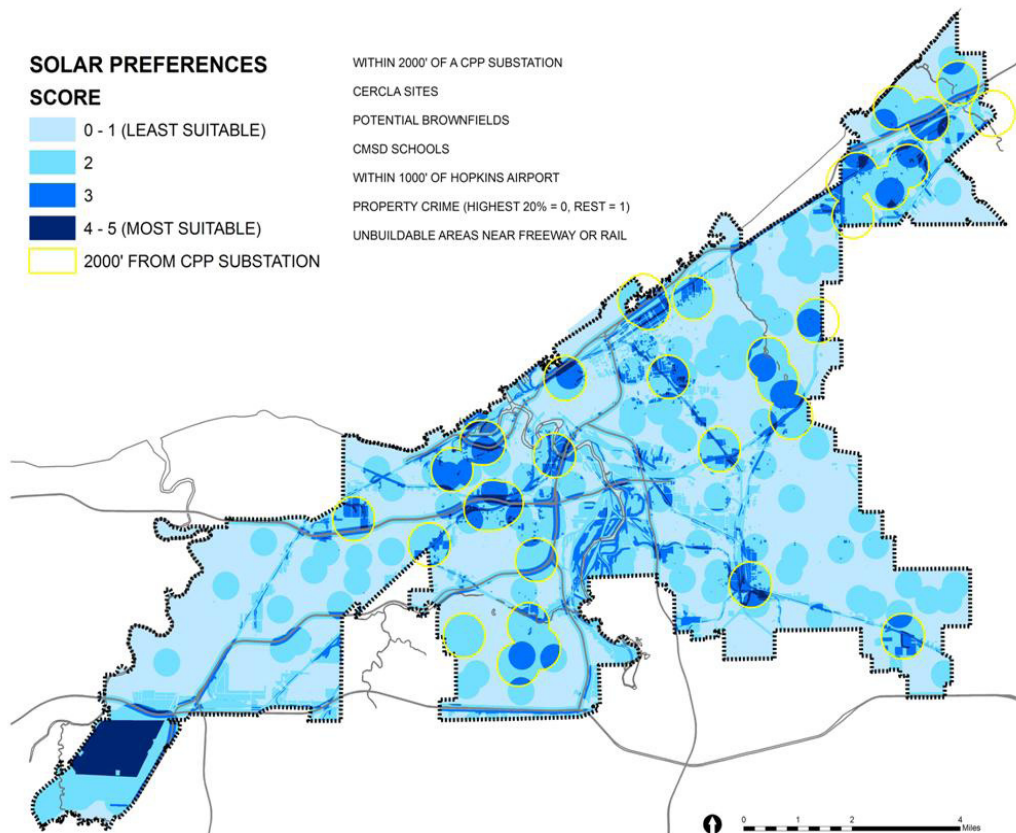
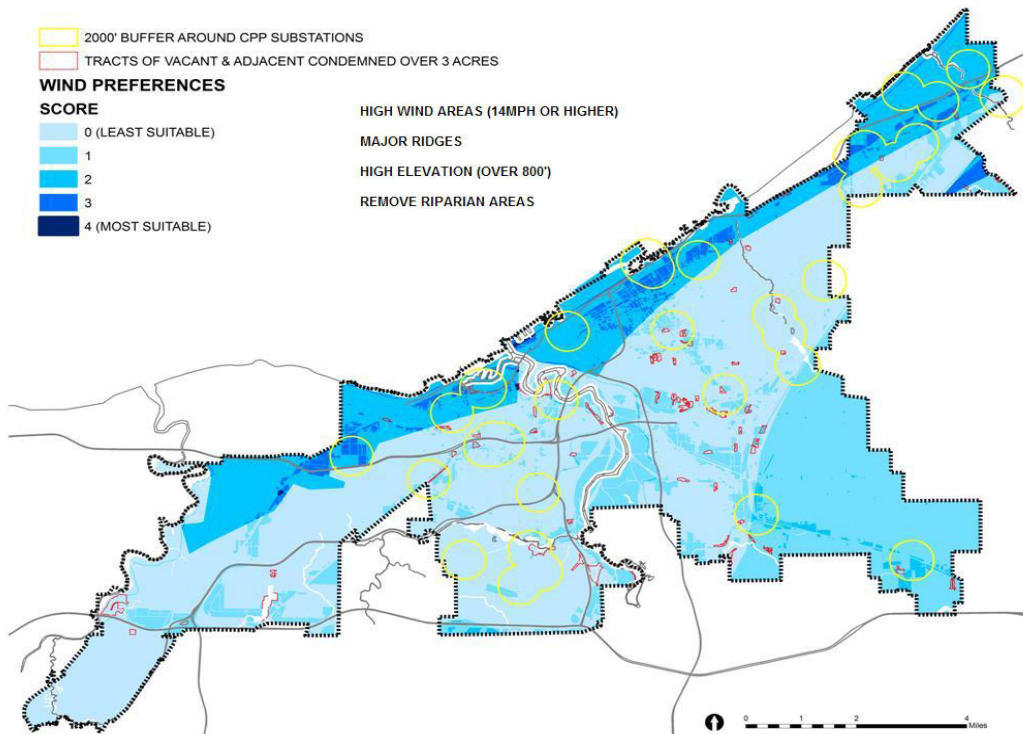
RENEWABLE ENERGY

Energy production is another possible use for vacant sites, which could reduce the region's reliance on fossil fuels. Unfortunately, existing urban infrastructure is not well-suited to this task. The electrical grid is not structured to draw energy from a wide range of sources and many renewable energy sources (such as solar and wind) require significant land area to produce power in commercially significant quantities.

As the map below illustrates, most viable areas for wind energy production are in and near the lake, and on higher elevations in the city and county. As a result, wind energy initiatives in greater Cleveland tend to focus on larger facilities where there are high wind speeds, rather than on smaller-scale installations on scattered parcels scattered throughout the city and county.



However, low cost vacant land may offer the potential for decentralized energy production that can supplement the needs of neighborhoods or individual households. The Cleveland City Planning Commission's vacant land working group on alternative energy identified areas of the city with higher wind speeds that are also within 500 yards of a Cleveland Public Power substation. Proximity to a substation reduces transmission losses when surplus energy, generated through a distributed network of sites, is transferred to the power grid. The most suitable locations in the city for wind and solar energy generation are show on the maps on the following page, based on criteria established by the city's alternative energy working group.



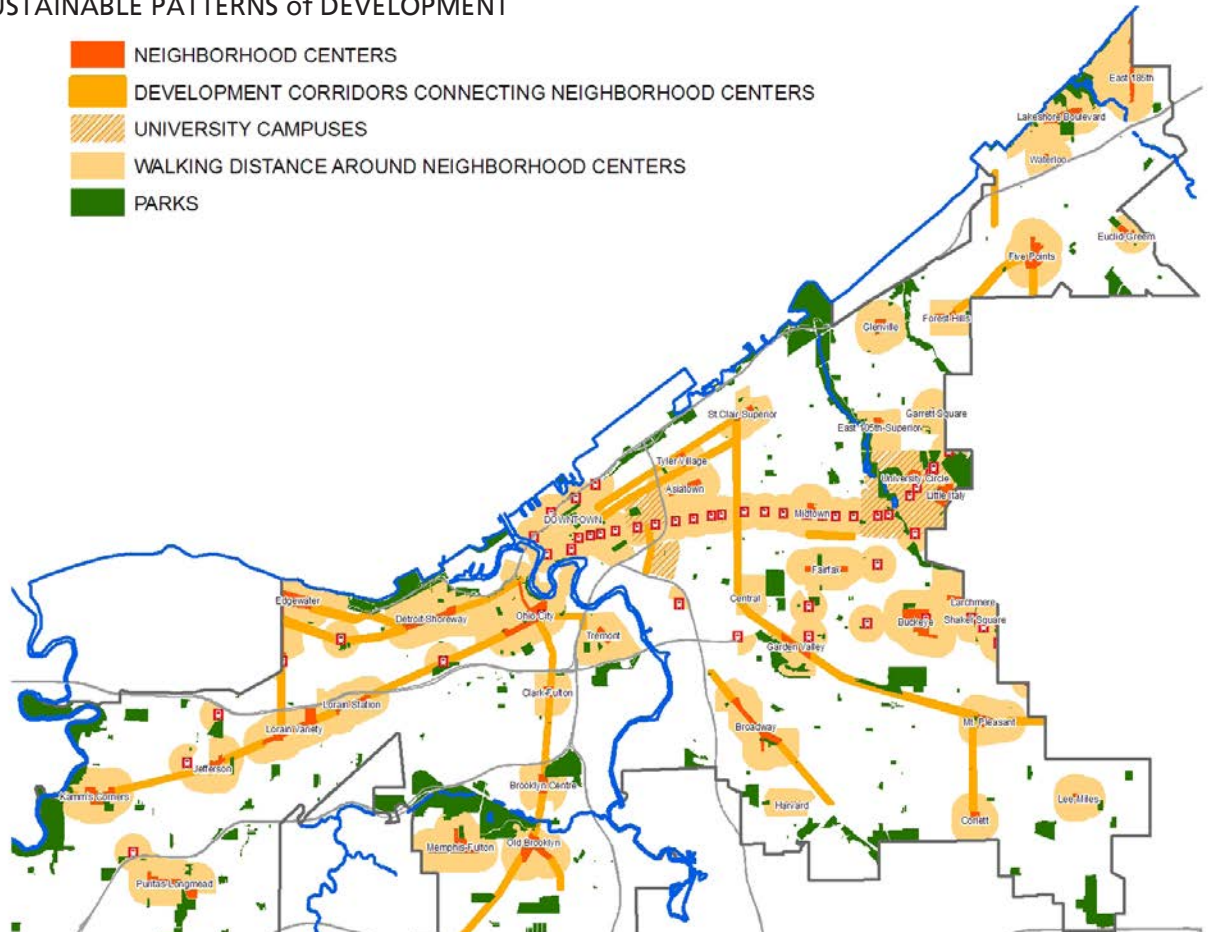
STABILIZATION, REMEDIATION, and SUSTAINABLE PATTERNS of DEVELOPMENT

Unmanaged vacant land has a detrimental effect on adjacent property values, whether this consists of a few scattered parcels, or a concentration of abandoned sites. Stabilization strategies are essential for vacant properties throughout the city and the inner-ring suburbs. However, establishing priorities for stabilization is necessary, particularly in Cleveland where resources are limited and vacancy levels are the highest. The city’s vacant land stabilization working group identified priority areas for vacant land stabilization based on visibility and future development potential.

Similarly, remediation efforts for contaminated vacant sites are important wherever contamination exists. But in the city, the needs exceed the resources available for remediation. The city’s vacant land remediation working group identified areas where remediation is most essential, based on areas of known contamination, proximity to concentrations of residents, and future development potential.

Over the last several decades, Cleveland has encouraged development projects wherever they could be supported, with the goal of attracting new investment throughout the city. Given the city’s on-going population loss and the devastating effects of the foreclosure crisis, a more strategic approach to development is now being considered. The city’s Sustainable Patterns of Development working group delineated areas where dense, walkable neighborhoods should be protected and preserved, and new infill development should be concentrated in order to take advantage of existing infrastructure and amenities. Priorities for sustainable development (shown on the map below) were determined based on proximity to existing neighborhood centers, university campuses and parks, and by access to transit.

SUSTAINABLE PATTERNS of DEVELOPMENT



VACANT LAND SIGNATURE PROJECTS

The maps and analyses in the previous section are intended to guide various vacant land reuse strategies toward the locations where they are most likely to be successful and replicable, leading to vacant land signature projects aimed that address economic, ecological, and social challenges across the city and county.

CRITERIA

The *Re-imagining* Steering Committee evaluated a wide range of signature project ideas using the following criteria:

- (1) BUT FOR this process, the idea would not go forward
- (2) Advance a VACANT LAND REUSE agenda
- (3) NO SILOS - weaving together multiple objectives
- (4) UNIQUE projects that are REPLICABLE
- (5) MEASURABLE impacts, SUSTAINABLE outcomes
- (6) Projects that address the SCALE of the vacancy challenge
- (7) Involving MULTIPLE JURISDICTIONS, city and county
- (8) Neighborhood stakeholder INVOLVEMENT
- (9) Projects that provide access to ECONOMIC OPPORTUNITY
- (10) Align with FUNDING OPPORTUNITIES, including NSP2 target areas
- (11) Projects that address HEALTH IMPACTS
- (12) ICONIC projects that change the image of Cleveland

OUTCOMES

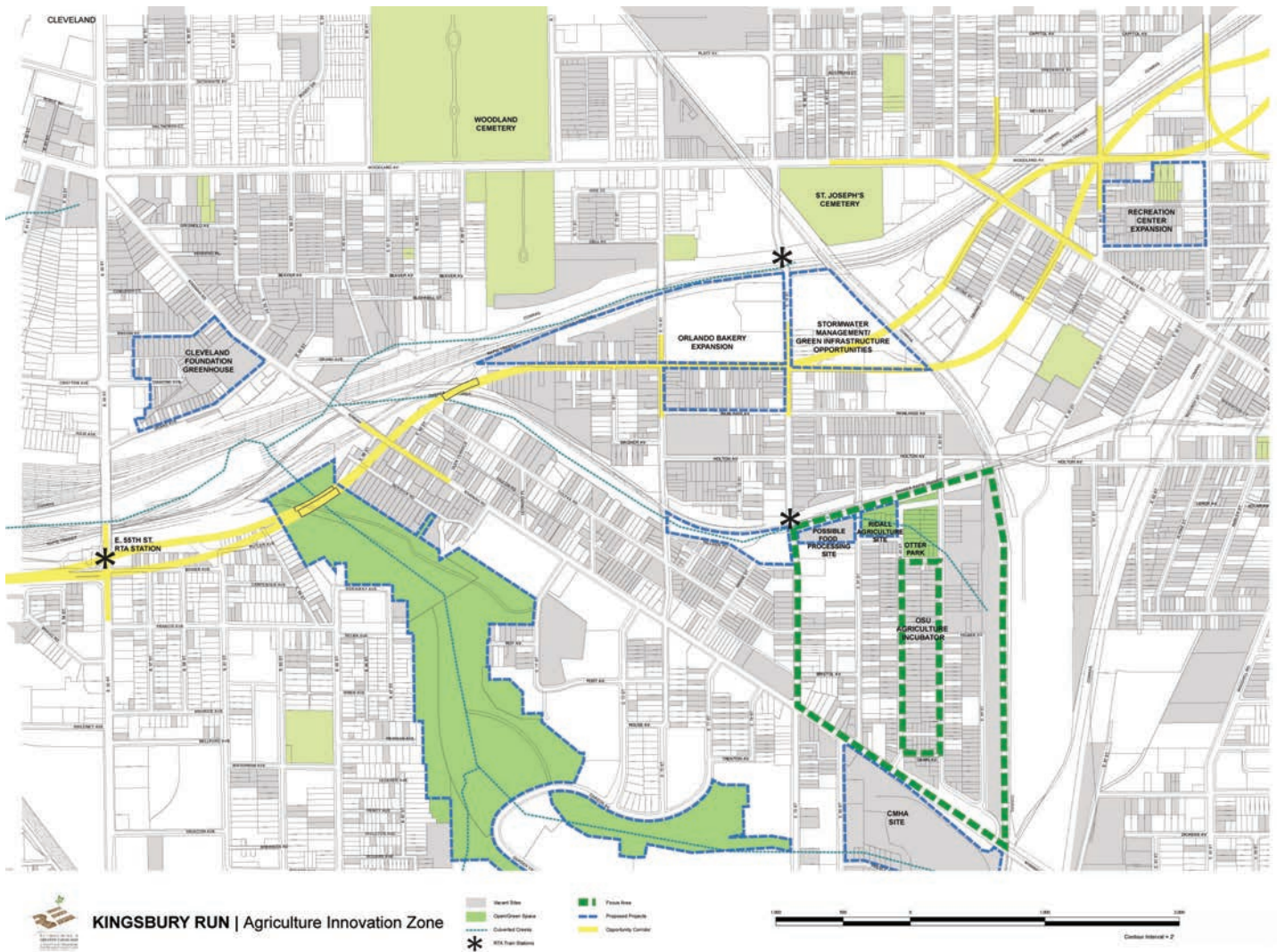
Signature projects are tied to three key outcomes:

- (1) *Hungerproof [Greater] Cleveland* and increase local self-sufficiency by using vacant land to grow and process food.
- (2) *Protect the lake/restore the region's urban watersheds* by using vacant land to manage stormwater runoff and restore natural hydrological processes throughout the city and inner-ring suburbs.
- (3) *Stabilize real estate values and reduce vacant land maintenance costs* by establishing more effective methods for maintaining and managing vacant land.

Based on input from the *Re-imagining a [Greater] Cleveland* Steering Committee and recommendations from the Cleveland City Planning Commission's eight vacant land reuse working groups, the following signature project ideas have emerged as priorities for moving forward.

HUNGERPROOF CITY

Kingsbury Run | Urban Agriculture Innovation Zone The Cleveland City Planning vacant land reuse working groups proposed a multi-faceted signature project for the Opportunity Corridor/Kingsbury Run area that incorporates land stabilization strategies, stormwater management, and urban agriculture. *Re-imagining* Steering Committee members expressed near unanimous support for a large-scale urban agriculture signature project, developed in conjunction with a business plan and a health impact assessment that integrates the economic and social impacts of the project. The Kingsbury Run | Urban Agriculture Innovation could become the anchor of a linked network of food producing sites in the city, suburbs, and region, consistent with the recommendations of a concurrent *Re-imagining Cleveland* local food study. The project will include design strategies to foster community acceptance of farming operations in urban neighborhoods, altering perceptions of the city in positive ways, increasing adjacent real estate values, and promoting a local tourism agenda.



The Urban Agriculture Innovation Zone (UAIZ) was initiated by the Burten Bell Carr Development Corporation and it includes the Rid-All Urban Farm and the Ohio State University Extension's Urban Agriculture Incubator project. Ultimately, many economically self-sufficient agriculture businesses are envisioned for the UAIZ. The UAIZ signature project will define a new urban district that leverages agricultural uses to increase property values within and around the district. The master plan for the UAIZ, currently underway, will identify infrastructure investments, develop a management framework, and design a branding strategy for the UAIZ. It will also include a financially backed plan for implementation.

Deliverables

- Comprehensive design approach for a Live|Play|Grow neighborhood
- Detailed plan for physical improvements, infrastructure investments, and programs needed to attract innovative, sustainable agricultural uses to the Innovation Zone, including a phasing plan with long and short term strategies for vacant land management
- Design and branding strategies to create a distinct and marketable identity for the Innovation Zone
- Business plan/operating strategy for Urban Agriculture Innovation Zone

Next steps

- Work with the City's consultants for the EPA-funded Opportunity Corridor development areas study (to coordinate work plans)
- Conduct a comprehensive community engagement strategy, in collaboration with Burten Bell Carr and Environmental Health Watch.

STORMWATER MANAGEMENT/WATERSHED RESTORATION

The region's underlying hydrology provides a useful mechanism for organizing vacant land initiatives and integrating the efforts and activities of multiple organizations and entities that have vacant land projects underway or under consideration. By clustering vacant land initiatives based on their location within their respective watersheds, we can begin to knit these projects together and evaluate their effectiveness in terms of ecosystem restoration.

Vacant land signature projects can help to fulfill the obligations of the Sewer District's Long Term Control Plan for reducing combined sewer overflows. The Sewer District has committed \$42 million to control 44 million gallons of CSO discharge using green infrastructure strategies in a new effort, *Project Clean Lake*. Vacant land strategies can be part of an overall green infrastructure approach to capturing stormwater and keeping it out of the sewer system, reducing CSO incidents.

The Kingsbury Run Urban Agriculture Innovation Zone, described in the previous section, will provide opportunities to capture stormwater and reduce CSO volumes, as runoff could be collected from streets and sidewalks, filtered through a landscape buffer, and used for irrigation in the UAIZ. There are other opportunities where vacant land may be used for large-scale stormwater management projects, including stormwater wetlands and other green amenities that provide public benefits and promote new development. The scale and location of these projects will be determined based on a green infrastructure study currently underway at the Sewer District.

Deliverables

- A series of large-scale green infrastructure projects that address the Sewer District's CSO obligations and create catalytic amenities in city neighborhoods

Next steps

- *Re-imagining a [Greater] Cleveland* Steering Committee to serve as advisory group for Sewer District's *Project Clean Lake*
- Establish memorandum of understanding that will enable the *Re-imagining* effort to provide on-going support for *Project Clean Lake*.



Examples of green infrastructure projects: Saylor Grove wetland park in Philadelphia (*left*); Tanner Springs wetland plaza in Portland (*right*).

STABILIZATION

Currently, Cleveland's land stabilization strategy consists of planting grass seed on vacant sites after a building demolition occurs. The property owner (or more often, the Cleveland Parks Department) assumes the responsibility for mowing these lots. The City of Cleveland spends approximately \$3.3 million per year to mow and maintain vacant lots in the city's land bank (more than 5,700 properties), along with privately owned properties that are not being maintained by the property owners. The city charges a fee for this service; any unpaid fees are added as a lien on the property title. Frequently, the city does not recover its costs. Instead, the lien can be used to force a tax foreclosure, after which the property becomes part of the city's land bank. The city gets the land and retains the responsibility for its maintenance unless the property is later transferred to a private owner. As a result, the city's responsibilities for vacant land maintenance continue to grow, while its financial resources to fulfill these responsibilities have declined.

Beyond city limits, some inner-ring suburbs have also seen an increase in vacant land maintenance responsibilities, particularly as houses are demolished in the aftermath of the foreclosure crisis. While vacant land issues have not reached the same level in the suburbs as in the city, suburban municipalities may face increased challenges and costs as the amount of unmanaged vacant land begins to increase in these communities.

A stabilization signature project will test ways to reduce maintenance costs for vacant sites, improve the appearance of these sites, and reinforce surrounding property values. In collaboration with the city and the county, the project will prescribe new methods for planting and maintaining of vacant sites. The preferred method (or methods) will first be implemented on a small number of test sites and eventually become standard practice for properties in the city and county land banks. Alternatives for large-scale stabilization include:

1. *Multi-tasking Landscape/Spread the Dredge* A stabilization strategy using phosphorus-based soil amendments and low maintenance ground cover plantings may provide a way to stabilize vacant sites, reinforce adjacent property values, improve soil fertility, limit residents' exposure to soil based-lead, and reduce the city's maintenance costs for vacant land management.

Cleveland's vacant sites typically lack the range of soil nutrients and organic matter needed to support healthy vegetation, resulting in a loss of ecosystem services such as air filtration, rainwater collection and infiltration, noise reduction, temperature regulation, and plant and animal habitat. Soil contamination, particularly lead contamination from paint and gasoline, is widespread in Cleveland and poses a risk to human health. Phosphorus is a low-cost treatment for both soil degradation and lead contamination. It is an important nutrient for plants and is a main ingredient in most plant fertilizers. High-phosphorus soil amendments have been shown to irreversibly bind to lead in soil, reducing its toxicity by up to 85% (per the research of Dr. Nicholas Basta of Ohio State University).

Dredged material from the Cuyahoga River shipping canal is one potential source of phosphorous. Disposal of dredged material is a major challenge for the Port of Cleveland. More than 250,000 cubic yards of sediment are excavated each year in order to keep the Cuyahoga River and Lake Erie shipping channels navigable. The current disposal facility (near Burke Lakefront Airport) is reaching capacity. Constructing a new disposal facility is a costly proposition and a location for a new facility has not been determined. If contaminants can be removed in a cost-effective process, dredged materials could be used to create a fertile top soil blend as a planting base for vacant sites. Remediation standards need be developed so this top soil blend could also be used for county-wide greening/parks projects and urban agriculture.

Improved stabilization techniques can also increase the ecological performance of vacant sites. Soil tests by the US EPA on vacant sites in Cleveland indicate that stormwater infiltration on a typical site is roughly equivalent to that of a paved parking lot. During a heavy rain, a significant amount of stormwater on these sites does not soak into the ground; it runs off into the storm sewer system. Most likely, this is due to soil compaction, a problem that is increased by the heavy equipment used for housing demolition. Turf grass has a shallow root system and does little to reduce soil compaction and allow for the infiltration of stormwater.

An optimal mix of plant materials could be identified that will provide habitat, increase biodiversity, reduce soil compaction, increase stormwater infiltration, reduce the city's maintenance costs, and provide soil coverage on vacant sites. These plants (or seed mixtures) need to be low in cost, easy to establish, and have a high survival rate in challenging urban conditions. Furthermore, the plants must form a landscape that is aesthetically and socially acceptable in city and suburban neighborhoods.

2. *Successional landscape*: Indigenous plant communities do not automatically become re-established when a neighborhood's population declines and formerly developed properties are abandoned. In order to reestablish a natural landscape and restore the urban tree canopy, soil conditions must first be improved by introducing smaller scale vegetation on urban lots. Grasses, groundcovers, prairie plants, and perennials can gradually be established, although this process requires great care and good stewardship. These smaller-scale plant communities add organic material to existing soils and their roots help to reduce soil compaction. Over time, these sites will begin to support larger scale plants, shrubs, and trees, leading to the return of something that will begin to resemble Northeast Ohio's pre-settlement landscape of oak savannahs and wetlands. The Slavic Village Development Corporation and Metroparks ecologist John Mack have developed a small-scale, successional landscape for several sites along East 71st Street, a street with numerous vacant lots. The project was designed to expand as additional vacant lots become available, creating a prairie/forest landscape that is integrated with the remaining houses.

On large industrial and commercial brownfield sites, a series of successional plantings could be devised that will use these sites to manufacture healthy soil. A short-term (five-year) strategy could be developed in which increasingly substantial plant materials are introduced on a site to rebuild soil structure. At the end of five years, the resulting soil could be transported for use elsewhere in the city or the county, and then the successional landscape process would begin again.

The city (and the county, or some portion thereof) could develop a proactive new strategy for the planting and maintenance of vacant sites and implement this strategy over a large percentage of the sites in the city and county land banks. The goal of this effort would be to significantly reduce vacant land maintenance costs.

Stabilization signature projects need to fundamentally change the existing system of vacant land management, so publicly funded maintenance crews are working more effectively and getting a better outcome. Innovative, cost-effective stabilization practices can be incorporated into the city's demolition specifications; new stabilization strategies can be phased in across the city, starting with the 1,000-plus vacant sites that are added to the city's inventory of vacant land each year as a result of demolition efforts.

Deliverables

Vacant land stabilization strategy, developed in collaboration with the city and the county land banks that aims to:

- enhance soil fertility on vacant sites so that attractive, low-maintenance ground covers can become well-established;
- reduce the city's mowing and maintenance costs through the use of plant materials that require less mowing and maintenance than turf grass;
- limit exposure to soil-based lead contamination;
- enhance property values by achieving a consistent appearance of maintenance and stability and stewardship for vacant sites throughout the city/county.

Next steps

- Convene meetings with the Cleveland Public Works Division, Cleveland land bank, and Cuyahoga County land bank staff to discuss a collaborative plan effort for large-scale land stabilization, focused on reducing maintenance costs and enhancing adjacent property values.
- Meet with the Army Corps of Engineers, the Port Authority, the City's Economic Development Department, and the Ohio Department of Development to discuss possible sites where dredged materials can be processed; whether these materials can be processed to meet a recreational standard or a higher (i.e. residential or agricultural) standard; and whether we can form a collaborative partnership in which dredged materials are processed for use in county-wide greening/parks projects, residential demolition programs in the city/suburbs, and urban agriculture projects.
- Prepare a scope of work for a land stabilization plan that would identify a range of standards and protocols for demolition procedures, soil treatments, landscaping, and maintenance. The study will include a detailed cost comparison of stabilization options, estimates of anticipated cost savings and ecological benefits, and an implementation strategy.

Implementation support

- *Urban Long Term Research Area Exploratory grant (ULTRA Ex)* The National Science Foundation has awarded Cleveland an ULTRA Ex grant to conduct research into the ecological reclamation of vacant land. The ULTRA Ex team includes scientific researchers from Cleveland State, the Cleveland Metroparks, Ohio State, and the staff of the Cleveland Urban Design Collaborative. ULTRA Ex has the resources for a high-profile vacant land experiment, and the various vacant land strategies described above could provide the basis for this work.

IDEAS for FUTURE CONSIDERATION

1. *Kerruish Park expansion/urban wetlands restoration project (Mill Creek)* The Cleveland City Planning vacant land reuse working groups identified a signature project for a group of properties near Kerruish Park. These properties were platted for residential use, but never developed. The sites are unprotected wetlands that contribute to the health of the Mill Creek watershed. Kerruish Park and the surrounding neighborhood offers an opportunity to create a multi-functional green space network that provides recreational opportunities and access to nature in the city, including the creation of a functioning urban wetland (using vacant residential properties), the protection of an urban forest (the northern end of Kerruish Park); the enhancement of an active recreation area (the main part of Kerruish Park); and the restoration of a natural riparian landscape along Mill Creek at the southern end of Kerruish Park. This project could have a county-wide impact, since the Mill Creek system extends from the eastern suburbs into the city.
2. *Economic indicators study* to develop parameters for measuring the economic impacts of vacant land signature projects, including the potential for job creation and the generation of tax revenues
3. *Inner-ring to Lake Erie connection (Dugway Brook)* There was strong support from the Steering Committee for a signature project that would use vacant lots to link Forest Hills Park (Cleveland Heights/East Cleveland) to Patterson Park (East Cleveland) to Bratenahl Park (Bratenahl) and Lake Erie. This intersects with the work of the Cuyahoga County Planning Commission, the Cuyahoga County Health Department, and the Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University (among other partners) to promote youth development and improved public health outcomes in East Cleveland. 150 residential demolitions are planned in East Cleveland. A signature project could focus on existing (and soon to be) vacant sites along the path of Dugway Brook as a network for managing stormwater, which also can offer recreational opportunities and access to nature in urban neighborhoods. As this effort develops, there may be an opportunity to create a signature project that supports this work.
4. *Bellaire Puritas project* using vacant land to address serious flooding issues. (CDC is working to address flooding problems with rain gardens, with funding support from NPI and NEORSD)
5. *Doan Brook* is the next CSO tunnel system set to go into engineering and design. The sewer district is interested in explore green infrastructure opportunities there before starting tunnel design. There may be an opportunity to work with the Sewer District and their consultant (Strand Associates) to identify vacant sites for green infrastructure in the Doan watershed.
6. *Five watershed framework (east side) and Six watershed framework (central/west side)* A plan for five interlinked watersheds on the east side of the city and inner-ring suburbs could be developed that integrate existing parks, streams, natural areas, and vacant sites into a larger green system. The watersheds include Doan Brook, Dugway Brook, the Kingsbury Run, Euclid Creek, and Nine Mile Creek. A similar effort could be made for six central/west-side watersheds, including Mill Creek, the Morgana Run, the Kingsbury Run, West Creek, Walworth Run, and the Cuyahoga River. These larger watershed-based networks would link park spaces and vacant sites together into bigger systems, creating new opportunities for the Metroparks to become involved in urban neighborhoods.

7. *Green Cap strategy* to create functional and beautiful landscapes on top of/in conjunction with NEORS D stormwater control projects; distinctive, usable green spaces that reinforce adjacent property values, build community support, make underlying hydrological systems legible, and allow for needed access and control to gray infrastructure systems by NEORS D.
8. *Emerald Fibers network* based on assembling and re-vegetating vacant land over the actual or approximate location of buried and culverted waterways. The resulting riparian pathways can be used to manage stormwater runoff that will, in turn, improve water quality in the river and the lake. These pathways also provide an opportunity to restore the city's depleted tree canopy and reduce urban heat island effects, reducing the energy costs for adjacent development. Over time, a network of formerly vacant sites will emerge as the green arteries of the city, connecting residents with the river and the lake, and creating attractive frontage for new development. Possible location: eastside Cleveland neighborhoods into the eastern inner-ring suburbs (along Doan Brook, Dugway Brook, and/or Mill Creek).
9. *Watersquare*: Dense urban neighborhoods tend to have an inadequate amount of infiltration space to absorb heavy rainfall. Parking lots, roadways, and other impervious surfaces further limit opportunities for stormwater infiltration. This causes flooding in some neighborhoods and contributes to Cleveland's problems with combined sewer overflows. A watersquare is a stormwater containment facility and a public amenity. A watersquare consists of a paved sports area/water basin and a hilly playfield. The sports area is sunken into the ground by one meter and is surrounded by steps that also function as seating for spectators. The hilly playfield is also sunken into the ground and provides different spaces to sit, play and linger with many different levels in height. Both spaces are connected within a green frame of grass and trees that border the square. Most of the time (an estimated 90% of the year) the water square will be dry and in use as a recreational space. Only when heavy rainfalls occur, the water square changes in its appearance and use. During a storm, the watersquare is designed to flood gradually. Short cloudbursts will only fill parts of the hilly play areas in the water square, creating streams, brooklets and small ponds where kids can play in and around the water. The rainwater will stay in the water square for a few hours until the water system of the city is back to normal. When cloudbursts are prolonged, more of the water square will be filled with water until finally also the sports area is flooded and the water square becomes a pure water storage basin. A watersquare can be designed to hold a maximum of one thousand cubic meters to cover the heavy rainfall on an entire neighborhood. The water square model was developed by the landscape architecture firm *de Urbanisten* in Rotterdam, but has yet to be built. Cleveland could be the first place where a watersquare is implemented.

MOVING FORWARD

As of August, 2011, planning efforts for the Kingsbury Run Urban Agriculture Innovation Zone are underway; a large-scale land stabilization project is being developed for residential parcels in the Neighborhood Stabilization (NSP2) areas and for a large parcel in the city of East Cleveland; and a collaborative effort to support the Northeast Ohio Regional Sewer District's *Project CleanLake* is taking shape. The *Re-imagining a [Greater] Cleveland* steering committee is serving as an advisory group for *Project CleanLake*.

Additional signature projects will be developed in response to emerging opportunities and available resources.

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