6

Re-thinking the Places in Between: Stabilization, Regeneration, and Reuse

Terry Schwarz, Kent State University

By definition, shrinking cities have an abundance of vacant property. A smaller population, fewer businesses, and reduced economic activity have far-reaching consequences, since all cities (shrinking and growing) are affected by fundamental laws of supply and demand. Many older cities have built too much and sprawled too much and now they simply have too much—substantially more housing, retail square footage, and office space than are likely to be needed for the foreseeable future. This oversupply of real estate puts downward pressure on real estate values throughout a metropolitan region, with the strongest impacts felt in core cities and inner-ring suburbs.

Numerous strategies for vacant-land management and reuse are being explored in some of the cities most affected by population decline, including Detroit, Cleveland, Youngstown, Pittsburgh, Philadelphia, and Buffalo. Generally categorized as "greening" strategies, these approaches have the potential to stabilize fragile real estate markets, restore urban ecosystems, improve public health and well-being, and foster economic growth.

Managing surplus real estate

The idea of a smaller, greener city provides useful rhetoric for older industrial cities, providing a way to frame the issue of population decline and urban vacancy in positive terms. But smaller and greener is difficult to achieve, especially in the con-

text of declining tax revenues, weak real estate markets, and the profound inertia that can take hold in cities that have been losing population for decades.

Value is derived from scarcity. As such, shrinking cities need to find ways to reduce their surplus of buildings and land in order to stabilize real estate markets. For a city to recover and thrive, this reduction must occur in intentional, strategic, and productive ways. An aggressive example of the real estate–reduction approach is "Wall it up and take a breath," a design concept developed by Peter Arlt and Letzelfreivogel Architekten for the city of Linz, Austria. Linz is an older industrial city, which is in the midst of transforming itself into a cultural center and tourist destination. To reduce the inventory of vacant land and reinforce property values in the city, Arlt proposed the construction of solid masonry walls, nine meters in height, around vacant sites for which there is no anticipated development use. These opaque walls were intended to be built without any fixed date for their removal.[1] The "Wall it up" concept, though it has never been implemented, provides an extreme response to the real estate dynamics in a shrinking city. In growing cities, surplus land is a valuable asset. In shrinking cities, market forces are inverted and surplus land becomes a liability. The out–of–sight, out–of–mind approach represented by "Wall it up" is an extreme measure to reduce supply and stimulate demand.

In American cities, public officials might find an idea like "Wall it up" to be rather preposterous. Yet many cities engage in a similar kind of real estate reduction strategy. Demolition programs in Cleveland, Buffalo, Detroit, and a host of other American cities aim to eliminate blighted and obsolete houses, and reduce the overall housing supply. Municipal demolition programs tend to be extensive in scale. In Cleveland, for example, over one thousand homes are demolished each year. By eliminating excess housing, cities aim to stabilize property values and improve the local real estate market. Some Smart Growth advocates have challenged this strategy, raising concerns that large-scale demolition programs erase urban fabric, reduce density, and limit future opportunities for regeneration.[2] There is a legitimate basis for these concerns. However, given the scale of the vacancy problem, these cities have no real alternative to demolition since there is a vast surplus of housing that is in poor condition and has little or no market value. In some instances, it may be possible to close up or "mothball" vacant buildings to protect them from weather and vandalism, although this would be cost-prohibitive except on a small scale. This process can delay demolition efforts, particularly if there is the potential for a building to be rehabilitated in the future, but vacant buildings cannot survive indefinitely in a boarded up condition. Regular monitoring of mothballed buildings and maintaining minimum interior heat levels are necessary to keep these structures intact. As such, mothballing efforts are generally directed toward architecturally or historically significant buildings, rather than being used on a more widespread basis.

Vacant houses often present a real and immediate threat to public safety. City residents demand demolitions, particularly when vacant houses are structurally unsound, attract illegal drug activity, or have a blighting effect on the appearance of a neighborhood. But large-scale demolition programs raise many difficult questions, such as:

- Do housing demolitions effectively stabilize surrounding property values by eliminating blight, or undermine property values by reducing neighborhood cohesiveness and creating new kinds of blight in the form of unkempt vacant lots?
- Can demolition programs be targeted to protect urban character and preserve historic resources for future use? When hundreds or thousands of houses are demolished in a given year, how can city officials be sure that they are not throwing away the good along with the bad?
- What are the long-term consequences of large-scale demolition programs? Will neighborhoods be irreparably damaged or will they benefit from new development opportunities derived from lot consolidations and targeted infill construction?

These issues are also discussed in Chapter 3 of this book.

Unfortunately, there are no clear answers to these questions. Demolition programs are likely to continue, given the large and growing number of vacant and deteriorated buildings in older industrial cities throughout the Midwest and parts of the Northeast. Taking into account the reality of ongoing demolitions and the vast amount of vacant land that already exists in many cities, strategies for vacant land stabilization and reuse are a critical part of the real estate equation. Instead of "walling it up and taking a breath," shrinking cities can "green it up" and put vacant land to productive use.

The "Reimagining a More Sustainable Cleveland" Approach to Vacant Land Reuse

It is difficult, but essential, for cities to manage vacant land in ways that provide short-term benefits and address long-term goals. One recent effort in this regard is the Re-imagining a More Sustainable Cleveland initiative. In 2010, the City of Cleveland had approximately twenty thousand vacant lots, which amounted to about 3,500 acres in total. The city's strategy is to introduce nontraditional urban land uses that reduce the supply of property and increase real estate values, based on three broad categories:

1. *Holding strategies* are deployed in areas where real estate development is most likely to occur in the near term. The city has mapped core

development areas and identified existing transit-oriented de-velopment nodes that need to be protected and reinforced with infill development as opportunities emerge. Holding strategies are low-cost, low-maintenance greening techniques that create an appearance of stability and stewardship. The goal is to reinforce positive perceptions of a neighborhood and to treat vacant sites as viable opportunities for future development.

2. *Green infrastructure* includes a wide range of vacant land strategies for improving natural systems in the city. A seemingly inevitable consequence of rapid urban growth is the destruction of native landscapes, such as wetlands and waterways, and biological diversity. Today's shrinking cities were the boomtowns of the last century. When development demand in Cleveland was high, the city grew with almost total disregard for underlying natural systems. The inverse is also true: Now that development demand is weak, new opportunities are emerging for ecological reclamation. Surplus real estate can be used to expand and connect parks and green spaces, restore the urban tree canopy, manage storm water, and reclaim badly damaged ecosystems.

   Green infrastructure strategies are intended to be long-term interventions, but the form and function of green infrastructure can be adapted to respond to on-going changes in real estate development demand. For example, a large vacant lot can be landscaped to hold and filter stormwater runoff. If the real estate markets improve and the property one day becomes a desirable development site, the new development project could provide a comparable storm water management function through the use of green roof technology, pervious paving materials for walkways and parking lots, and other best management practices. The most important aspect of vacant land management is the realization that cities constantly grow, shrink, and change. In this context, vacant land is a valuable resource because it allows a city to adapt to changing circumstances in ways that support positive economic and ecological outcomes.

3. *Productive landscapes* are a strategy for extracting an economic return from vacant sites. Vacant land can be used for food production and the generation of alternative energy. 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 have an essential role in increasing access to healthy foods for city residents. If development demand increases, acres of land devoted to food production can be reconfigured into a more compact footprint. For example, greenhouses and vertical farming can provide a similar output as a more land-intensive urban farm. As land becomes more valuable, compact agriculture can allow food

production and more traditional urban development to coexist comfortably. Flexibility is the key factor in vacant land reuse. Strategic vacant land management builds resiliency into transitional urban neighborhoods.

Agriculture may eventually become a more economically viable land use in older industrial cities, particularly if farming efforts can be expanded beyond field crops for local consumption. Some examples of how a local food economy can be expanded to create jobs and increase tax revenues include:

- Greenhouse operations to extend the growing season and increase production yields
- Community kitchens and other food processing facilities to add value and profitability to locally grown food products
- Bio-digester facilities that convert food waste and other organic material into renewable fuels and plant-based polymers

Energy production is another possibility for vacant sites. In recent years, it has become apparent that we need to reduce our 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 alternative energy sources (such as solar power) require significant land area to produce power in sufficient quantities. Low cost vacant land may offer the potential for developing alternative, decentralized energy sources. As federal and state governments invest in projects to expand the proportion of energy demand that is met by renewable sources, cities with an abundance of vacant land may find that they have a comparative advantage in this area.

The Re-imagining a More Sustainable Cleveland approach is essentially a framework for making informed decisions about the disposition of vacant sites. The goal is to manage vacant properties in ways that stabilize current conditions and establish clear patterns for more sustainable urban development in the future.[3]

Three Spatial Models For Shrinking Cities

Strategies for the reuse of vacant land need to be guided by a long-term vision, or at least a reasonable assumption, about what a city is to become. This vision (or assumption) will help to determine how remaining residents, businesses, and institutions can best be supported by city services and infrastructure. In the discourse concerning shrinking cities, there is an ongoing debate as to whether cities should consolidate remaining residents and development activity into compact urban nodes or allow population to disperse in ways that reduce overall urban densities. There are benefits and challenges with both of these approaches. Consolidation and dispersion represent two opposite tendencies, neither of which could ever be fully realized in a shrinking city. In the end, all outcomes will be a hybrid of some

sort, and the hybrid model is the third option to consider.

Consolidation: In the consolidation model, a city experiencing population decline would push (or coax) remaining residents together into the most intact and viable parts of a city. Ideally, this would create or preserve dense, walkable neighborhoods. Vacated parts of a city would become parks, forests, or "wilderness" areas, with vibrant interlinked neighborhood nodes set within this system of green space. The appeal of this model is that it enables shrinking cities to retain or re-create a strong sense of urbanity. It also allows for more efficient delivery of city services such as street maintenance, trash pickup, and snow plowing. And it provides a clear–cut approach for managing social infrastructure, since decisions regarding transit, schools, churches, and hospitals could all be made to reinforce clearly established neighborhood nodes.

The consolidation model works well as a design concept, but it may be difficult to implement in the context of a real city. It is rare to find a city with large areas of near total depopulation. Populated and depopulated neighborhoods are often adjacent and interwoven. Patterns of real estate demand frequently shift, making it difficult to determine where to consolidate development and where to decommission neighborhoods and encourage relocation.

The biggest challenge is that even in the most devastated areas of a shrinking city, there may be substantial numbers of existing residents who resist relocation efforts. City residents often have strong ties to their neighborhoods, based on established social networks, memories, and emotional connections that may be invisible to outsiders. Remaining residents often include the most vulnerable members of an urban population—people who are impoverished and entrenched. The needs of these residents must be carefully considered to determine if relocation is truly in their best interests, in order to provide a safer neighborhood, a higher quality of life, and better access to employment opportunities, retail businesses, and transit.

An attempt at the consolidation model began in Detroit in 2010.[4] Detroit may eventually discontinue public services to roughly a third of the city's geographic footprint—this is an idea currently under exploration. Residents in the affected areas would receive incentives to move to one of between seven and nine population centers. The city is exploring the idea of discontinuing services to nearly forty-five square miles of the city.[5] Whether Detroit's consolidation efforts become a model that can be replicated elsewhere remains to be seen. But this is a bold and aggressive attempt to reduce city costs and realign the real estate market.

From a land use perspective, the consolidation model presents further challenges. The underlying idea of consolidation is that vacated parts of a city can be converted to green spaces or revert to a natural state. However, a smaller population may result in lower demand and usage for additional green spaces, and cash-strapped cities may lack the resources to maintain an expanding green space

network. Allowing land simply to revert to a natural state is a complicated proposition. Urban land does not automatically return to "wilderness" once people leave and buildings are demolished. Natural ecosystems tend to be highly disturbed by urban development. Changes in hydrology, soil conditions, and microclimates often mean that native species can no longer survive in these altered settings. More likely, vacated areas will be naturalized by invasive species—tough and aggressive plants that thrive in difficult urban conditions. Over time, this de facto vegetation strategy may help to restore soil structure and give way to healthier and more diverse ecosystems. The process is slow and the evolving landscapes may look ragged and weedy for extended periods of time.

Without careful management, vacated areas that are allowed to "return to nature" may trigger negative reactions from neighboring residents and businesses, and have a detrimental effect on surrounding property values. A landscape strategy for managing vacant land in Flint, Michigan and the surrounding county addresses this issue of public perception by proposing a cultivated strip of turf grass at the street edge, with a more natural landscape of indigenous materials beyond. The three-foot wide grass strip can be maintained with a single pass of a lawn mower, keeping the costs of maintenance to a minimum while establishing the appearance of stewardship in transitional neighborhoods.[6]

Dispersion: The dispersion model involves lot consolidations, in which adjacent property owners take ownership of surplus land, increasing lot sizes, and reducing neighborhood density. Small-scale green spaces, community gardens, and other vacant land interventions further reduce the overall density of neighborhoods in response to emerging and evolving patterns of vacancy. The dispersion model is already under way in many older industrial cities, occurring organically as a result of many individual decisions at the neighborhood level. Large-scale demolition programs reinforce the dispersion model, since houses are often demolished based on condition rather than location. It is fairly uncommon for a city to clear an entire block, much less an entire neighborhood, unless a redevelopment project is imminent. More often, demolitions occur in a dispersed fashion, with some concentrations in areas where disinvestment and foreclosures are prevalent.

Since the dispersion model is in effect in many cities (and has been for decades in places like Cleveland and Detroit), opportunities abound for assessing the impacts of changing density patterns on property values, access to services and amenities, and neighborhood character. If the process of dispersion is carefully managed, land–use decision making can occur at the grassroots level through flexible, neighborhood-based strategies. By embracing the dispersion model, cities can avoid the social upheaval and high costs of relocation, as residents are supported in place as a neighborhood evolves.

The downside of the dispersion model is that it can "suburbanize" a city. Neighborhoods that were once dense, walkable, and transit-friendly may become

sprawling, incoherent, and inaccessible. Lot consolidations may have long-term impacts, since once a lot is in private hands, infill development is more difficult and density reductions may become permanent. Also, the delivery of citywide services becomes increasingly expensive as fewer residents are dispersed throughout the entire urban footprint, rather than concentrated in core areas. Finally, downsizing of infrastructure networks cannot occur without consolidating residential areas in some way.

Hybrid: A hybrid approach delineates certain areas of a city for consolidation while allowing others to evolve through the process of dispersion. In implementing this approach, a first step would be to identify areas of a city to hold for future development, including both large-scale and infill development. A city can develop its own criteria for selecting and prioritizing development areas. Some criteria may include:

- Condition of existing infrastructure
- Access to freeways and transit
- Current and projected real estate values and development interest/activity
- Land availability, particularly the availability or larger parcels and opportunities to assemble smaller parcels into a larger redevelopment site
- Proximity to anchor institutions and other locational assets
- Current and projected population

In consolidation areas, a city can focus resources and development activity in ways that restore and reinforce density in areas where development is most likely to be sustainable.

Another important step is to identify ecologically sensitive areas for parkland expansion, conservation, and ecosystem restoration. A city can look at its entire inventory of current and soon to be vacant properties and determine which sites should be acquired and protected as part of the public realm. It is important to keep in mind that the most heavily abandoned areas are not necessarily the most logical places for greening strategies. In areas where vacancy levels and abandonment are high and property values are low, a city can assemble large parcels of land—these larger parcels offer the most flexibility and value for a wide range of future uses.

For the land that remains after property has been set aside for public–realm improvements and development interests, a city can facilitate the transfer of land outside of delineated areas to private interests of varying scales, including individual home owners, community development corporations, and neighborhood entrepreneurs.

The main benefit of the hybrid model is that it maintains and reinforces density in areas where new development will be most viable. It offers control of strategic areas and flexibility everywhere else. However, it may be difficult to articulate

clear, defensible criteria for developing real estate–holding areas. It may also be expensive to set aside and maintain large areas for green–space expansion, ecosystem restoration, and other improvements to the public realm. Furthermore, some degree of suburbanization is likely to occur in areas outside of real estate holding and green space expansion areas. And inequities are inherent in this type of dual strategy, because the choices a city makes will have measurable impacts on property values.

Designing For the Places In Between

In 1991, the Department of Landscape Architecture and Regional Planning at the University of Pennsylvania produced a vacant land resource book as part of the West Philadelphia Landscape Plan. This pioneering effort, led by landscape architect Anne Whiston Spirn, established a useful typology for urban vacancy, combined design concepts, and potential uses for each type of vacant site. Vacant land types included isolated vacant sites, corner lots, connector lots, dispersed vacancy, and multiple contiguous blocks of vacant sites. Design ideas were introduced for infill construction, private gardens, play lots, outdoor markets, meadows, orchards, pocket parks, and other uses.[7]

In 2008, the Cleveland Urban Design Collaborative and Neighborhood Progress, Inc. produced a vacant land pattern book to serve as a guide for pilot projects throughout the city of Cleveland. The pattern book included design concepts for gardens, small-scale farms, parks, parking lots, geothermal wells, infill development, native–planting schemes, and other interventions, along with cost estimates for implementing these concepts.

Parcel-based design ideas for vacant land are most effective when they can be aligned with a citywide vision. The reuse of vacant land is an ongoing process, evolving over the course of many years and involving thousands of decisions, large and small, throughout a city. In Cleveland, the guiding vision was derived from the twin objectives of restoring urban watersheds and eradicating hunger in city neighborhoods and throughout the region.

Watershed Restoration

Like many cities in the Great Lakes region, Cleveland has an abundance of water and an intricate pattern of natural hydrology that extends from the suburbs into the city. But most of the city's water is hidden. Streams and creeks were contained in culverts many years ago when the city's rapid growth required the erasure of indigenous waterways. But now, as the city's vacancy grows, there is an unprecedented opportunity to restore a more natural pattern of hydrology through the assembly of vacant sites in alignment with buried waterways. A public policy could

be established to declare vacant land on top of or within the vicinity of a buried culvert as off-limits to development.

From an ecosystems perspective, it was never a good idea to build on top of water. As a city's portfolio of vacant land continues to grow, sites that coincide with buried waterways can be set aside, assembling a green network one parcel at a time. It is important to note that daylighting streams (or restoring them to a natural condition) is a vastly expensive proposition. As such, it is unlikely that all of Cleveland's culverted waterways will ever be restored to a wholly natural condition. However, there are numerous examples where stream daylighting strategies are being deployed. For example, Cincinnati's Lick Run is currently being restored as a naturally flowing above ground waterway. This will help convey storm–water runoff to Mill Creek, and reduce combined sewer overflows (CSOs). Combined sewer overflows are a problem in older industrial cities throughout the Midwest and Northeast. In these cities, sanitary sewers and storm sewers often run through the same trench. In heavy rains, untreated sewage and storm water mix and are subsequently discharged into rivers, streams, and lakes. This is a major source of water pollution, and cities that have CSOs are obligated by the Federal Clean Water Act to correct the problem. But the solutions are very expensive, requiring major infrastructure investments, at a time when many of the cities impacted by this issue are experiencing declining tax revenues and fewer residents to share the economic burden. The Lick Run project is being funded as part of Cincinnati's long term control plan for addressing CSOs. The stream restoration will reduce CSO volumes and it is also intended to provide an urban amenity to attract residents and investment back to the city.

Not all stream daylighting projects are intended to address CSO issues. Kalamazoo, Michigan's eighteen million dollar effort to daylight Arcadia Creek was part of a flood prevention and downtown redevelopment plan. The creek area is now a festival site, hosting events that generate twelve million dollars in annual revenues. Annual property tax revenues near the restored creek have risen from $60,000 to $400,000.[8]

Even when stream daylighting is cost-prohibitive, it is still potentially useful to assemble vacant properties along the actual (or approximate) paths of buried creeks and streams, re-establishing native landscapes on these properties to restore surface hydrology. The culverts would remain intact, for now. But the intermittent strands of vegetation that emerge through vacant land assembly would direct rainwater along more natural paths along the surface of the ground, allowing for infiltration into the soil, rather than runoff into the storm sewer system. These would not be manicured green spaces or engineered storm water features. Instead, an approximation of Cleveland's pre-settlement landscape could be restored in the form of slightly wild and beautiful greenways, which could evolve into high functioning natural landscapes. There are several benefits to doing this:

- By preserving the land above culverted streams, the possibilities remain open for future daylighting projects, because culverts will fail eventually and new resources may become available for future stream restoration.
- In Cleveland, the paths of buried waterways intersect with parks, schools, and many other amenities. Plus, 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.
- Natural greenways would increase biodiversity and wildlife habitat in urban neighborhoods.
- Perhaps most important, it would be transformative, from an urban design standpoint, to have these strands of wilderness meandering through city neighborhoods. They could be the green stitches that hold together an increasingly fragmented and fragile city.

Older industrial cities face enormous costs when addressing aging sewer infrastructure. In Cleveland, the CSO problem will cost the region more than three billion dollars to correct. A systemic approach to using vacant land for stormwater management will establish a green infrastructure network for the city, aligning vacant land reuse strategies with the substantial technical and financial resources of the regional sewer district.

Hungerproof City

Shrinking cities often have concentrations of impoverished residents, many of whom experience chronic hunger. Vacant land is a resource that can be used to generate calories. Cleveland's vision is to create a hungerproof city, in which the regulations regarding the use of vacant land and flexible land open up new opportunities for getting vegetables and protein to the people who need them most.

Zoning laws that accommodate urban agriculture, farm animals, and the sale of locally-produced food products can help support the needs of residents and enable micro-scale entrepreneurs to develop economically viable models of local food production. A new agrarian model for declining cities is beginning to emerge—one that puts vacant land to productive use and accommodates all kinds of people, along with their chickens, goats, and bees. Cleveland adopted two zoning ordinances intended to promote agriculture and address chronic hunger. The first ordinance (adopted in 2009) allows farm animals to live in urban neighborhoods, provided they are courteous to their human neighbors. The ordinance allows residents to keep chickens, ducks, rabbits, and bees but not roosters, geese, or turkeys. A typical residential lot can have up to six small animals and two beehives. The second ordinance (adopted in 2010) permits urban

agriculture as the principal use of a vacant residential lot. Previously, agriculture was allowed only as an accessory use. This ordinance also allows farm stands as a conditional use on residential lots when the produce is grown on site. In adopting these zoning ordinances, Cleveland gave greater legitimacy to the burgeoning urban agriculture movement, which has helped to foster greater self-sufficiency among city dwellers.

A hungerproof city accommodates a variety of agricultural operations, including small gardens, large farms, greenhouses, and agriculture incubators, brought together in attractive multitasking farmscapes. Over time, the patterns of agricultural production can be integrated into urban neighborhoods to feed the hungry and create compelling places that people will want to live near and visit.

Large-Scale Land Reclamation

Maintaining growing inventories of vacant land is a major expense for many older industrial cities. For example, the city of Cleveland spends $3.3 million per year to mow and maintain vacant lots across the city. The number of lots grows each year, even as the city's capacity to maintain them dwindles.

New methods are needed to shift vacant land practices from stabilization to reclamation. This will reduce the high cost of vacant land maintenance and maximize the potential benefits for city residents and urban ecosystems. The main objectives of vacant land management programs are typically to improve the aesthetics of vacant sites and to enhance adjacent property values. But vacant land management can also provide other valuable benefits, such as a reduction in maintenance costs, an improvement in ecological functions, and reduced public exposure to soil-based lead and other contaminants.

In many cities, a postdemolition strategy consists of sowing grass seed on vacant sites. Aside from the cost of ongoing maintenance, vacant sites present ecological challenges. Turf grass planted on vacant sites offers relatively limited benefits in terms of ecosystem performance. Based on soil tests performed by the U.S. EPA on vacant sites in Cleveland, the storm water infiltration on a typical vacant site is roughly equivalent to that of a paved parking lot. Most likely, this is because urban soils tend to be compacted and this compaction is further increased by the heavy equipment used for building demolition. Also, turf grass has a shallow root system and does little to reduce soil compaction and allow for the infiltration of storm water.

Vacant sites can offer more opportunities for storm water collection and infiltration if a wider range of vegetation is planted on vacant land. At the scale of a city, increased storm water infiltration helps to improve water quality and reduce flooding. Turf grass offers little benefit in terms of wildlife habitat and biodiversity. A wider range of plant materials on vacant sites could enhance urban

ecosystems by creating habitat for birds, butterflies, pollinators, and other wildlife. A more diverse landscape would also begin to restore fertility to degraded urban soils so that the city's tree canopy could be gradually expanded. Increased soil fertility also ensures more complete ground cover on vacant sites, which would, in turn, reduce human exposure to soil-based contaminants such as lead and other heavy metals that are prevalent in many older neighborhoods.

An optimal mix of plant materials needs to be identified that will provide habitat, increase biodiversity, reduce soil compaction, increase storm water infiltration, reduce the city's maintenance costs, and provide full soil coverage on vacant sites. These plants (or seed mixtures) must also 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 culturally acceptable in city and suburban neighborhoods. Large-scale vacant land stabilization can be achieved through several interrelated alternatives. Cities can adopt new protocols for the planting and maintenance of vacant sites and implement these practices on properties after building demolitions have taken place.

As discussed previously, indigenous plant communities do not automatically become reestablished when a neighborhood's population declines and formerly developed properties are abandoned. If a city seeks to restore some aspects of its presettlement landscape and support a mature urban forest, soil ecosystems must first be restored by introducing smaller scale vegetation on urban lots. Grasses, ground covers, prairie plants, and perennials add organic material to existing soils and reduce soil compaction. Over time, vacant sites may begin to support larger scale plants, shrubs, and trees, leading to the return of something that begins to resemble a native ecosystem.

Vacant land reclamation efforts require a sound scientific basis in order to be effective. In Cleveland, the Northeast Ohio Ecosystem Consortium (NEOECO) was established with the support of the National Science Foundation's Urban Long–Term Research Area Exploratory grant program (ULTRA-Ex). NEOECO is a group of environmental and social scientists, natural resource management professionals, urban planners, and landscape designers who provide scientific and technical guidance for the ecologically-motivated redevelopment of vacant land, as a mechanism for creating social and ecological stability within distressed urban neighborhoods.

NEOECO's work includes:

- Development of a rapid assessment tool based on expert scientific knowledge that will allow communities to evaluate vacant properties for reuse for ecosystem services (for example, storm water mitigation, urban agriculture, soil/water purification, biodiversity, etc.)
- Characterizations of existing ecosystem services provided by vacant and

re-purposed lands (for example, community gardens, and the economic and social value of these lands to local communities)

- Long-term studies comparing changes in ecological, hydrologic, and social variables in response to redevelopment for ecosystem services

This evolving research is based on conditions in Cleveland but will have applications for land assessment and management for older industrial cities throughout the Great Lakes region, and possibly beyond.

Transitional Urban Landscapes: In a depopulating city, surprising land use juxtapositions become increasingly common. Low density and high density neighborhoods may exist side by side. Agricultural uses may spring up in and around the urban core. Prairies, meadows, and orchards may emerge as a growing presence in the urban landscape. Unpredictability can be disconcerting and disorienting, but it can also be part of the authentic charm of an older industrial city. Urban design efforts should focus careful attention on the seams between incongruous land uses and deploy landscape strategies that cultivate public acceptance of more natural vegetation in urban settings.

Infrastructure Issues

Older industrial cities are often faced with the dual challenges of an aging infrastructure and dwindling municipal revenues. It can be a struggle to maintain an infrastructure network that was designed to accommodate the needs of a much larger population, and cities are learning how to do more with less. Many cities have been forced to cut back on street and sidewalk maintenance, often without a formal plan or public input. Some cities, most notably Detroit and Youngstown (OH) have explored ways to scale back infrastructure networks in response to population decline. Physical infrastructure (transportation, water/sewer, energy) is difficult to reconfigure; social infrastructure (schools, hospitals, transit) offers greater flexibility and adaptability to demographic changes.

Cities may attempt to reconfigure or downsize infrastructure in an effort to reduce costs. Smaller infrastructure networks require fewer public service employees to maintain and can result in lower maintenance costs. But there are also several compelling reasons for cities not to downsize existing infrastructure, including:

- *Capital costs:* There is an immediate, tangible capital cost to removing surplus infrastructure. Roads, bridges, and sewers cannot just be abandoned, as this can create public hazards. The immediate capital costs of removing infrastructure must be weighed against a possible maintenance savings sometime in the future. In other words, it will be necessary to spend significant public dollars today for a possible incremental benefit in the future. Public works officials may be hesitant to bank on this strategy, par-

ticularly since research and established best practices are sparse in the area of decommissioning infrastructure.

- *Network capacity*: Infrastructure operates on a fixed grid. It is difficult to remove components in vacated areas without impacting the whole system. Water, sewers, roads, and power lines often need to extend through depopulated neighborhoods in order to get to areas of the city and region where concentrations of people continue to live and work.
- *Uncertainty*: Patterns of growth and shrinkage are difficult to predict. As such, it might be better to incur the costs of maintaining an entire infrastructure network at some minimal level rather than to remove infrastructure that may need to be reinstated at some point in the future. There is little evidence that maintenance cost savings from downsizing infrastructure would outweigh the opportunity costs of removing something that might prove useful in the future.
- *Redundancy*: When cities are dealing with aging infrastructure, redundancy is useful. Bridges fail, water and sewer lines break, and pumping stations need to come offline for maintenance. Redundant aspects of an infrastructure network provide a back-up that enables a city to provide continuous service in the event of emergencies and infrastructure failure.
- *Competitive advantage*: Surplus capacity—particularly in water, energy, and transportation infrastructure—is a competitive advantage that can be used to attract businesses and economic development to a city and surrounding region. Eliminating surplus infrastructure in response to current budgetary challenges could prove counterproductive over the long term.

Rather than eliminating infrastructure, shrinking cities might focus instead on optimizing the use and functions of existing infrastructure in ways that reduce current costs while preserving opportunities for future growth and development. Asset management strategies, better coordination across infrastructures, and the use of smart technologies can help to optimize infrastructure investments in shrinking cities.

- *Asset management*: It is common practice for cities to inventory their assets and make assessments of the condition of each asset. This helps to establish priorities for infrastructure acquisition, maintenance, repair, and renewal. Shrinking cities can particularly benefit from efforts to improve and optimize data collection and analysis regarding infrastructure assets. Good data enables cities to set clear and defensible priorities for spending limited resources. Because shrinking cities tend to face acute resource constraints, improvements in these analytical processes for infrastructure decisions may be of particular value.

- *Coordinating across infrastructures*: There has been very little research into the ways in which changing practices in one infrastructure sector may yield costs savings or efficiency improvements in other sectors. For example, while the cost savings from decommissioning roads may be minimal, it is possible that removing large quantities of pavement in depopulated areas could yield hydrological benefits, which, in turn, reduce storm water management costs. Similarly, improvements to public transportation infrastructure may yield substantial reductions in overall energy use and demand. While there is no hard data to confirm that substantial savings can be achieved through any of these kinds of cross sector changes, it would seem appropriate to investigate these relationships further as a potential approach to infrastructure changes in response to population decline.
- *Smart Technologies*: Technological advances may enable cities to manage infrastructure more efficiently and effectively. In the energy sector, advanced metering methods may enable both decentralized energy production utilizing geographically dispersed parcels of vacant land and access to information that would enable residents and businesses to understand how their behaviors influence the amount and cost of electricity they use. In the transportation sector, new technologies may enable both faster and more efficient reports about congestion and traffic patterns that can yield more efficient time management for travelers, reduced costs, and environmental benefits. In the water and wastewater sectors, new technologies may allow for better and less costly leak detection processes for water systems, as well as automated systems for predicting failures in levees and for monitoring water quality. These technological advances will benefit all cities but may be of particular value in older industrial cities, where the process of providing equitable and cost effective infrastructure investments is more difficult.

More research is needed in the area of sustainable infrastructure for shrinking cities. Until the short and long-term benefits of downsizing infrastructure can be determined and quantified, cities should proceed with caution before making major reductions to existing networks.[9]

Conclusion: Managing Decline For Sustainable Re-Growth

In the United States, population is projected to grow from about 308 million people in 2010 to between 419 and 439 million people in 2050. This rapid growth is expected to occur through a roughly even split between new immigrants and increases in the natural birth rate.[10] Shrinking cities in the United States exist in the context of national growth. This is markedly different from the situation in Europe and Japan, where shrinking cities exist in shrinking countries.

National population growth in the United States may present some opportunities for older industrial cities. Looking at the ten major cities that have lost the most population between 1950 and 2000 (Detroit, Chicago, Philadelphia, St. Louis, Cleveland, Pittsburgh, Baltimore, Buffalo, Boston, and Washington, D.C.) one can see that the total population loss among these cities is about 4.5 million people. This loss, while obviously significant for the cities involved, is relatively small when viewed against the net national population growth of 129 million people expected by 2050.[11]

A national smart growth policy could help to direct at least a small percentage of the anticipated population growth at the national level toward the repopulation of older industrial cities. In the same period between 2010 and 2050, the United States needs to reduce its carbon emissions significantly—perhaps by as much as 80 percent—to avoid irreversible environmental damage as a result of climate change.[12] Reclaiming older industrial cities and the embodied energy they represent can be a critical component of a national strategy for reducing carbon emissions.

There are tremendous uncertainties as to the future of older industrial cities. It is difficult to tell whether population decline will continue unabated in some cities, or whether populations will stabilize and turn toward eventual regrowth. It seems unlikely that cities experiencing substantial and ongoing population loss will ever regain their peak populations. But opportunities may emerge for gradual repopulation and the long term stabilization of urban real estate markets. In positioning older industrial cities for the future, the emphasis needs to be on managing current conditions of decline while simultaneously laying the groundwork for sustainable redevelopment over the next forty years and beyond.

How we deal with "the spaces in between" will have a major impact on the ability of older industrial cities to recover and thrive in the new century. Strategic land use decision-making, an emphasis on the restoration of urban ecosystems, and close attention to the design of interrelated urban systems will guide these cities on a path toward recovery.

Notes

1. Oswalt (2006).
2. Gratz (2010).
3. Cleveland Land Lab (2008).
4. Detroit Works Project (2010).
5. Wattrick (2010).
6. Nassauer and VanWiereny (2008).
7. Sprin, A.W., et. al. (1991).
8. Hamilton County Planning and Development (2011).
9. Hoornbeek and Schwarz (2009).
10. Alperovitz (2009).
11. U.S. Census (2000).
12. Alperovitz and Williamson (2010).

Bibliography

Alperovitz, G., and T. Williamson, 2009. *Climate Change, Community Stability, and the Next 150 Million Americans*. College Park: Democracy Collaborative, University of Maryland.

Cleveland Land Lab, 2008.

Colgan, I., "Case Studies in University Led Neighborhood Revitalization." Available at http://www.development-concepts.com/blog/2010/06/case-studies-in-university-led-neighborhood-revitalization/.

Gratz, R., "Saving Shrinking Cities." Huffington Post. Available at http://www.huffingtonpost.com/roberta-brandes-gratz/saving-shrinking-cities_b_670389.html.

Hamilton County Planning and Development. 2011 "Community Revitalization Resulting from Stormwater Management Strategies: Case Studies." Hamilton County Planning and Development.

Hoornbeek, J. and Schwarz, T., 2009. *Sustainable Infrastructure in Shrinking Cities—Options for the Future*. Cleaveland: Center for Public Administration and Public Policy and the Cleveland Urban Design Collaborative, Kent State University.

Oswalt,Phillip, ed. 2006. *Shrinking Cities. Vol. 2, Interventions*. Berlin: Hatje Cantz.

Nassauer, J., I., and VanWieren, R. 2008. *Vacant Property Now & Tomorrow: Building enduring values with natural assets*. Ann Arbor: Genesee County Land Bank Authority and Michigan Sea Grant.

Re-imagining a More Sustainable Cleveland 2008. Cleveland: Neighborhood Progress, Inc., and Cleveland Urban Design Collaborative, Kent State University.

Sprin, A.W., et al. 1991. *Vacant Land: A Resource for Reshaping Urban Neighborhoods. Philadelphia Landscape Plan*. Department of Landscape Architecture and Regional Planning, University of Pennsylvania.

Wattrick, J., "Downsizing Detroit: Mayor Dave Bing says city will incentivize residents to move into 7 to 9 core areas," *MLive.com*. December 09, 2010.

Case Study: Re-Imagining Cleveland: Pilot Land Reuse Projects

Bobbi Reichtell, Neighborhood Progress, Inc.

What does a city built for 900,000 residents do when it has less than half of that population, has 3,300 acres of vacant land, and wants to create a healthier, greener, and more economically vibrant city? Key partners from multiple sectors are responding to the foreclosure and vacancy issues in Cleveland, Ohio, through visionary data-driven planning, policy, and system changes, land-reuse demonstration projects, and critical collaborations across organizational boundaries in the Re-Imagining Cleveland initiative.

With over two decades of sustained investment by local and national funders and a history of collaboration among nonprofits, city government, and the private sector, Cleveland has built a significant community development record that has been recognized nationally. Shifting to respond to the impact of national housing and economic market forces, along with regional demographic shifts in population, that same nonprofit, government, and university collaboration is being used to create a visionary plan to help the city use vacant land to remake itself. The long-term goal is to build a community stewardship movement in Cleveland by providing ideas and resources to residents to repurpose vacant land, putting the most current and expansive data available in the hands of community development corporations, and working across sectors on policy and system changes that address foreclosures and vacancy.

As the city of Cleveland increased the number of demolitions of blighted and foreclosed homes, there was a dramatic increase in vacant land. Current estimates of vacant lots are approximately twenty thousand (7 percent of the city's land mass), with the city adding approximately fifteen hundred per year through its increased demolition effort fueled by stimulus funding. The resulting vacant land can either become a deficit to neighborhoods or be developed as an asset for the remaining residents.

The purpose of the Re-Imagining Cleveland initiative is to create new urban landscapes that better serve communities. These landscapes are envisioned to be made up of sustainable, distinctive neighborhoods with more efficient and valuable housing surrounded by repurposed land providing community benefit. Whether this land is used as green spaces, community gardens, urban farms, or creative storm water-management systems, its future is being determined and shaped by community residents and nonprofit community development corporations (CDCs) in partnership with Cleveland city government.

The Re-Imagining Cleveland initiative began with a partnership between Neighborhood Progress, Inc (NPI), a local community development funding intermediary, the city of Cleveland's Planning Department, and Kent State University's Urban Design Center (KSU UDC) on a vacant land study. The initiative brought together over thirty local government and non-profit agencies with expertise in land use, environmental planning, storm water management, parks, agriculture, brownfields, and economic development to develop proactive strategies to right-size Cleveland and manage vacant land. Through this study, the City's Planning Department developed a land use decision matrix for evaluating appropriate reuses of vacant land in light of economic variables, sustainability goals, and local quality-of-life factors. An Idea Book for Vacant Land Strategies was developed by NPI and KSU UDC, which provides designs, budgets, resources, and guidance to the public as a tool in building a community-land stewardship movement in Cleveland.

Based on this work, a small pilot initiative was privately funded and organized by NPI and carried out in six city neighborhoods. About $50,000 of foundation funds were provided to community development corporations which in turn, worked with neighborhood groups and individuals to develop twenty small-scale vacant lot projects in strategic locations. Recognizing the enthusiastic reception by residents and CDCs, who at last had access to resources and strategies to address neighborhood vacant land issues, NPI and the city agreed to expand the pilot program citywide. Cleveland's Community Development Department provided $500,000 of NSP funding from the Department of Housing and Urban Development, and NPI raised foundation funds and in-kind services. Currently, over fifty demonstration projects are being implemented around the city. The primary land reutilization strategies fall into the following categories:

- Greening, small parks, and walking paths
- Urban agriculture—community gardens, urban farms, vineyards, and orchards
- Side-yard expansions and lot splits between neighbors
- Storm water management—rain gardens and bioswales
- Off-street parking with pervious paving

- Remediation of polluted sites through bio- and phyto-remediation techniques.

The program has enabled a range of people, from seasoned community leaders to first-time project entrepreneurs, to engage in remaking their streets, if not their whole neighborhoods. There are people like forty-year-old Curtis Banks, who was inspired to follow in his father's footsteps and creating a new community garden in the Hough neighborhood, previously known for its riots in the 1960s. He says, "When I was a little kid, there was a house torn down next to us. My father, being just one generation removed from sharecropping, loved to play in the dirt. He would plant gardens every year and supplement feeding the family with what he grew in that garden. He often grew more than we could consume, so he would give stuff away to people who were in need. So it became part of me to want to carry on that tradition of gardening."

A few streets away, Mansfield Frazier, a locally-renowned civic activist and writer in his sixties, is becoming an entrepreneur with the development of the Château Hough vineyard. With program funding, he has planted hundreds of grapevines on a prominent vacant corner that is flanked by vacant buildings on either side. He will expand to many more lots over the next few years and plans to open a winery—a stone's throw from the nationally acclaimed Cleveland Clinic.

And there is Todd Alexander, who along with two friends, is creating east side and west side urban farms in the Central and Ohio City neighborhoods. They are putting their entrepreneurial spirits and recent college degrees in sustainability into action and helping to address "food deserts," areas where fresh fruits and vegetables are limited. They are part of a new breed of twentysomethings who are putting Cleveland on the national "local food map" and creating new career paths in urban agriculture. (Cleveland is ranked second nationally in local food by SustainLane.)

To enable this work, the Cleveland Community Development Department Land Bank is working hard to surmount regulatory issues with HUD in order to be able to respond to the increased volume of vacant land and the public's interest in it. The city's Land Bank program, the holding agent for eight thousand of the city's twenty thousand vacant lots, has crafted policy and administrative changes to streamline vacant lot disposition. The city's Water Department is crafting new policies and fee structures for water usage to accommodate community and entrepreneurial vacant land reuse projects. The City Planning Commission and the Cleveland City Council have adopted zoning changes and legislation that protect gardens and farms through garden-district zoning and allow for easier use of land for agricultural purposes, including keeping small livestock and bees. To foster local food entrepreneurs, the Cleveland Economic Development Department offers a small grant and low-interest loan program for market gardens and urban farms for start-up business costs.

Where is all of this headed in the short and long term? A vacant land council is being organized to coordinate the myriad vacant land initiatives being carried out by public agencies and private nonprofits. An evaluation is underway to compare Cleveland's program with those of Flint, Indianapolis, Pittsburgh, Philadelphia, and Baltimore. Planners are studying how to move this work to scale. Aligning public resources, community energy, and technical knowledge on the most challenging issues is beginning to create powerful changes that will serve the city well for decades.