



## LAND RECYCLING 101

### What is land recycling?

Land recycling is the act of re-using abandoned, vacant or underused properties. A subset of land recycling is infill development, or development that takes place within an existing community and leverages the available transit, water, sewage, electrical and other infrastructure.

### What is a brownfield?

Many areas across the country that were once used for industrial and commercial purposes now sit abandoned or underutilized, and are prime candidates for land recycling. Some of these properties are contaminated, while some have never been tested but are assumed to have environmental problems.

These properties are *brownfields* defined by the U.S. EPA as “real properties, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.” Typical brownfield properties include abandoned gas stations, factories, nurseries and dry cleaners.

### Why recycle land?

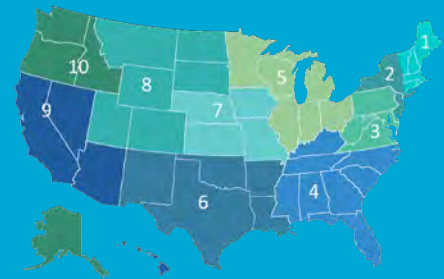
Cleaning up brownfields can transform communities, improving environmental and human health and propelling economic revitalization. Benefits include:

- Removal or treatment of harmful substances that impact our health and groundwater.
- Increase in property values.
- Use of existing infrastructure and conservation of land.
- Job creation and increased tax revenue.
- New housing, commercial spaces, recreational areas and parks.

### ABOUT CCLR

The Center for Creative Land Recycling (CCLR) is the oldest national non-profit organization pioneering brownfield and infill development to promote human and environmental health and economic revitalization. CCLR is also part of the U.S. EPA's Technical Assistance to Brownfields Communities Network.

### HELP IN YOUR AREA



You can receive free technical assistance from an EPA Technical Assistance to Brownfields (TAB) Provider:

**The New Jersey Institute of Technology (NJIT)** - Regions 1 & 3  
**Kansas State University (KSU)** - Regions 5,6,7 & 8

**Center for Creative Land Recycling (CCLR)** - Regions 2, 4, 9 & 10

### FOR MORE INFORMATION:

- Green Building Alliance: [go-gba.org/resources/green-building-methods/brownfield-remediation/](http://go-gba.org/resources/green-building-methods/brownfield-remediation/)
- Brownfields and Land Revitalization Technology Support Center: [brownfieldstsc.org/roadmap/contguide.cfm](http://brownfieldstsc.org/roadmap/contguide.cfm)
- Environmental Protection Agency: [epa.gov/brownfields](http://epa.gov/brownfields)
- U.S. Department of Housing and Urban Development: [hudexchange.info/programs/bedi/](http://hudexchange.info/programs/bedi/)

# CENTER FOR CREATIVE LAND RECYCLING

## Why is land recycling a challenge?

Because lenders, investors, and developers fear that they may be required to clean up environmental problems they did not create, they often prefer to build on suburban or rural sites that have not been used for development, called *greenfields*.

Developing greenfields instead of re-purposing brownfields can result in car-dependent sprawl outside the city and vacant, blighted inner city areas that undermine public safety and health. Brownfields redevelopment therefore supports densification, or the development of communities with more activity and residents per block. Though sometimes cast as a negative, adding density fills in vacant places and builds stronger, healthier local economies and communities.



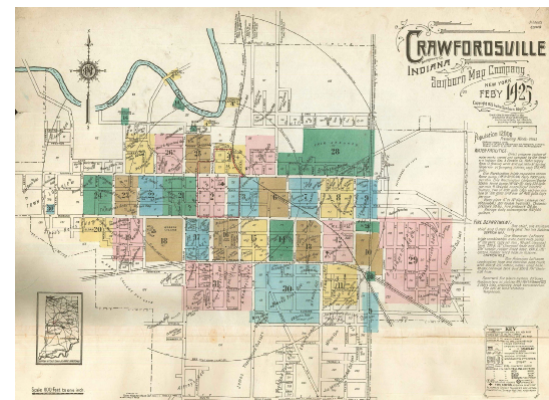
Urban sprawl is characterized by inefficient land use that consumes land faster than the population is growing. Sprawl creates neighborhoods with segregated residential and commercial areas almost exclusively accessible by car. Photo by Steve Randolph.

## How does land actually get recycled?

Land recycling starts with an examination of a property's past uses. This initial historical study of the site is what is called a Phase I Environmental Site Assessment and gives us clues as to what contaminants we might expect to find in the soil and/or groundwater.

During a Phase 2 assessment, subsurface samples are analyzed to confirm the type, level and location of contamination on-site. Contamination might not be equally spread across the property: one area might have a pollution "hot spot," for instance, and another might be affected by an entirely different contaminant. Phase 2 assessments help chart this and plan for clean-up.

Following a Phase 2, additional studies may be required to establish site-specific cleanup goals or develop cleanup plans.

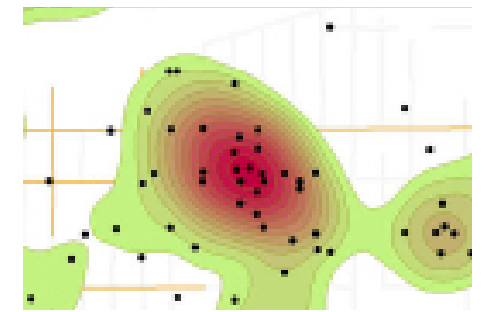


Sanborn fire risk maps are an important tool in conducting a Phase 1 assessment, as they provide historical land use data as far back as the 1860s.

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## Will a Phase 1 or Phase 2 get me in trouble?

A Phase 1 will identify potential concerns on a site that may require further investigation through a Phase 2. A Phase 1 will not result in regulation by a state or federal regulatory agency. If, under a Phase 2, the presence of contamination is confirmed, it may be necessary to report the results to a regulatory agency.



Point sampling map around a hot-spot of contamination.

## How does cleanup work?

The goal of remediation is to ensure that the site is cleaned up consistent with zoning and the intended reuse of the property. A parking lot, for instance, will require a different level of cleanup than a lot being converted to a community garden. Future residential sites have higher standards than commercial sites and will therefore be more expensive to clean up.

There are a variety of remediation techniques for groundwater or soil. These range from the removal of polluting tanks, pipes and other objects, to excavation of contaminated soil and disposal offsite. Another common approach involves containing contaminated soil via barriers like clean soil, plastic or other impermeable surfaces.

There are also innovative and less conventional approaches that include the use of plants, microbes or mushrooms to degrade or stabilize contaminants.



The sunflower, with its deep root structure, has the ability to absorb certain metals like lead and arsenic into its biomass in a process called *phytoremediation* and can be used to clean up some sites, like the one pictured here in St. Louis, MO. Photo by Sunflower + Project.

## What is the cost and time involved in land recycling?

Assessment and cleanup costs are additional development costs that largely determine whether redevelopment of a brownfield is feasible. The U.S. EPA and many states offer assessment, cleanup, job training and revolving loan fund grants to lessen the financial burden.

**Time is money**, and also plays a big part in remediation decisions. So does the technical reliability of the remediation method, as any remaining pollutants need to be managed over time. A Phase 1 can be completed in a few months for typically between \$3,000 and \$10,000, depending on the complexity and size of the site. A Phase 2 may take several months and cost at least \$20,000.

## What about ownership & liability?

Liability often presents a concern. Following the passage of the Comprehensive Environmental Regulation, Compensation, and Liability Act (CERCLA) in 1980, the past, present and future owners and users of a site could be held liable for cleanup. In 2002, the Small Business Liability Relief and Brownfields Revitalization Act added certain liability protections to CERCLA. Guidance from lawyers and consultants is often needed to move a project through the legal and regulatory framework and allay investor concerns.

## What roles do local governments, the community and private sector play?

There are many stakeholders involved in land recycling: the city or municipality where the property is located, state and federal government agencies, community organizations, tribal authorities, developers, lenders, private and public service providers, and regulatory agencies. Their respective roles depend in part on who caused the contamination, the nature of the cleanup required, whether the land is publicly or privately owned, the extent to which there is active private interest to develop the property and the engagement of the community in the visioning and planning process. Leadership at the local and community level are ingredients in any successful land recycling project.



## It can't be done without you: how to get involved.

Your involvement is critical to garnering input and support for the sustainable and equitable redevelopment of underutilized or contaminated properties in your community. As a public official or local resident, you can organize educational forums, join local committees or testify at public hearings. As a community leader, you can become knowledgeable about environmental projects and the health and safety issues that impact your community and have an effective voice in planned development. As vested participants in the process, rather than bystanders, residents are more likely to actively support a remediation and development plan that they understand and have helped develop.