

# Let it Grow!



## Build Your Urban Forest with Brownfields

Trees are your community's best friends. They provide endless benefits, including cleaning the air, managing stormwater, lowering the temperature, and creating habitat; they add beauty to their surroundings and provide shade.

### Your Community's Trees Are An "Urban Forest"

The trees and vegetation in your community comprise an urban forest. Your community's urban forest includes the trees and vegetation on your streets and boulevards, on public and private properties, and in your parks, gardens, river and coastal walkways, greenways, river corridors, wetlands, and nature preserves.

As a community grows or changes, new roads and buildings increase the paved impervious areas. Trees and plants are often lost as part of the development process. Dark-colored paved areas absorb heat creating a phenomenon known as the heat island effect. Keeping cool requires more energy, and more energy use increases greenhouse gas emissions.

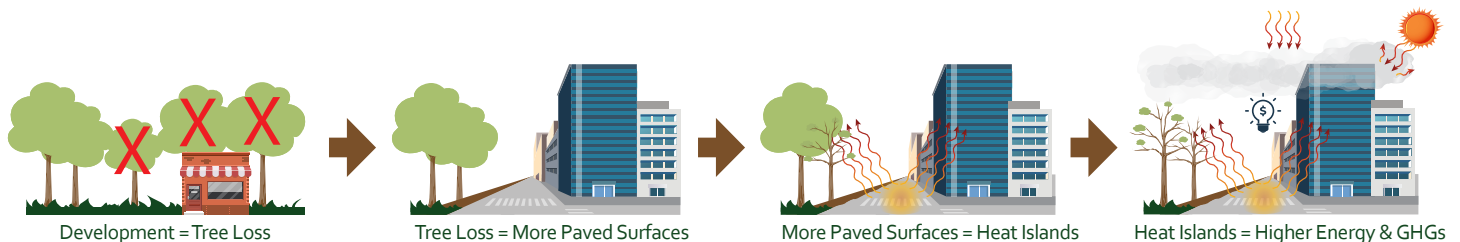
Trees and plants work hard in your community! They:

- Reduce heat island effect
- Improve degraded or contaminated soil
- Create and expand habitat
- Reduce erosion and flooding
- Mitigate and adapt to extreme weather



Beyond improving the environment, the trees and plants in your community provide many social, public health and economic benefits. They:

- Beautify the community
- Foster community connections to nature
- Enable access to green space for recreation and relaxation, which improve both physical and mental health
- Increase economic activity



### Brownfield Sites Can Help Your Community Build Your Urban Forest

#### What do the trees in your community have to do with brownfield sites?

New or emerging urban forests may include trees and vegetation growing on vacant, neglected, or underused properties. These properties are considered brownfields because they are or may be contaminated. It is important to first consider if mature and healthy trees can be preserved, rather than removed, during the site assessment, cleanup, and reuse process. Healthy trees growing on a site have adapted to the site environment and contaminant conditions.









## How Can Our Community Save Existing Trees on Brownfield Sites and Plant Healthy New Ones?

### Saving Existing Trees

Healthy, mature trees provide many environmental, social, and economic benefits and should be preserved where possible. Raising this important topic during community outreach and throughout project planning can help your community prioritize existing urban forest coverage and discuss the need to expand the urban forest.

The chart below describes how you can save existing trees throughout a brownfields redevelopment.

PHASE		TIPS
 Pre-Project	<ul style="list-style-type: none"><li>Identify any trees near the areas that are being considered for site sampling or cleanup.</li><li>Identify which <u>tree root systems could be damaged</u> by equipment during site sampling or cleanup. Identify where to stage equipment and materials to protect tree roots.</li></ul>	This is also a good time to identify invasive tree species that should be removed.
 Site Reuse Planning	<ul style="list-style-type: none"><li>Map out specific locations of existing and future trees on-site reuse designs.</li><li>Map the paths of heavy machinery away from existing trees.</li></ul>	If you must have heavy machinery drive near existing trees, drive the machinery over thick plywood.
 During Site Assessment	<ul style="list-style-type: none"><li>Identify how existing contaminants are affecting current trees.</li><li>Look for signs of stress or mortality (dead branches or excessive rainfall).</li></ul>	<a href="#">Web Soil Survey</a> is a good resource for soil data, which can be used for tree selection, and local and wider area planning.
 During Site Cleanup	<ul style="list-style-type: none"><li>Conduct site cleanup activities in a manner that protects existing trees and their root systems.</li><li>Avoid driving heavy machinery around existing trees to <u>limit soil compaction</u>.</li></ul>	Effective strategies to prevent damage include protective fences, trunk protectors, and having root zones mapped out. These strategies can be left in place after site construction.
 During Site Construction	<ul style="list-style-type: none"><li>Be flexible with your site design—You never know what you are going to find when you start digging.</li><li>It is important to prune back any branches that are broken, using <u>proper pruning techniques</u>.</li></ul>	See " <a href="#">A Guide to Preserving Trees in Development Projects</a> " to understand the tolerance/resiliency of tree species to construction.
 Post-Project	<ul style="list-style-type: none"><li>Monitor existing trees after the project for stress or diseases.</li></ul>	Construction damage may show in trees in the first couple of weeks but is more likely to be seen in the first couple of years.

### Planting New Trees

Brownfield assessment, cleanup, and reuse projects also provide opportunities to expand, diversify or create new urban forests. Consider how the site **location** and **soil** characteristics will affect new trees, and how proper **maintenance** of the trees will keep them healthy over time.





## Will Your Tree Thrive After Planting?

### Location

- Considering current and future climate conditions is important for proper urban tree species selection. The [Tree Selection tool](#) can help identify ideal tree species to plant depending on the site's climate and space restrictions, as well as its availability to sunlight and water.
- Be sure to maximize tree diversity across the planting location; tree diversity encourages the coexistence of various plant and animal species and reduces the risk of pests affecting all of the trees at the same time.

### Soils

- Urban soils are often compacted, which makes it difficult for growing trees to get enough air and water, and makes it hard for the root system to grow.
- Is the soil contaminated? See [Brownfields and Urban Agriculture](#) and [Know Before You Grow](#) for more information.
- What are the soil properties? The amount of organic matter, sand/silt/clay content, and moisture availability will affect whether new trees will thrive.

### Maintenance

- Newly planted trees often need to be watered during the growing season for 2-3 years after planting (or longer).
- Watering bags or other methods such as "leaky buckets," and drip hoses can be placed at the tree's location to provide water when soil conditions are dry.
- Urban trees, especially newly planted trees, need to be periodically monitored to assess for pests, disease, and overall tree health.

### Did You Know?

Lack of access to urban greenery is a key characteristic of urban social inequality, including socioeconomic and racial inequality.



### Ways to Involve the Community in the Brownfields & Trees Project

- Offer community members training on trees and their maintenance. Your [State Urban Forestry Coordinator](#) or [Community Forest Program Manager](#) may be able to help.
- Conduct a [volunteer tree survey](#)
- Gather community feedback and concern surrounding urban forest operations and planning.
- Create a local nursery and train and hire local community members.
  - The Forest Service Program [Reforestation, Nurseries, and Genetic Resources](#) (RNGR) provides Technical Assistance and research to assist nursery operators.

### A Check-List to Increase Your Community's Urban Forest

- ☐ Plan where new trees can and will be planted throughout your city.
  - ☐ Assess existing trees and their location. This can be done:
    - via remote sensing and using satellite imagery. The [i-Tree tool](#) and the [Tree Canopy app](#) are an easy way to calculate your communities tree canopy coverage (as well as impervious surface and other land cover).
    - by hiring a tree inventory company to collect this information, or
    - by organizing a volunteer tree survey and getting the community involved.
  - ☐ Identify where street trees are missing and create a plan to fill gaps.
- ☐ Consider planting trees when cleaning up [brownfields in your community](#). Two tips:
  - Map out underground infrastructure and other obstacles that may limit tree planting.
  - Plan where trees will be placed as part of cleanup and site grading, so you are better prepared for planting.
- ☐ Create a maintenance plan for new and existing trees – i.e., how often and when to prune, mulch, water, etc.
- ☐ Plant trees and let them grow!
- ☐ Continuously monitor and execute your maintenance plan.

## CASE STUDY

### Landfill to Waterfront Park Filled with Nearly 400,000 Trees, Shrubs, and Plants

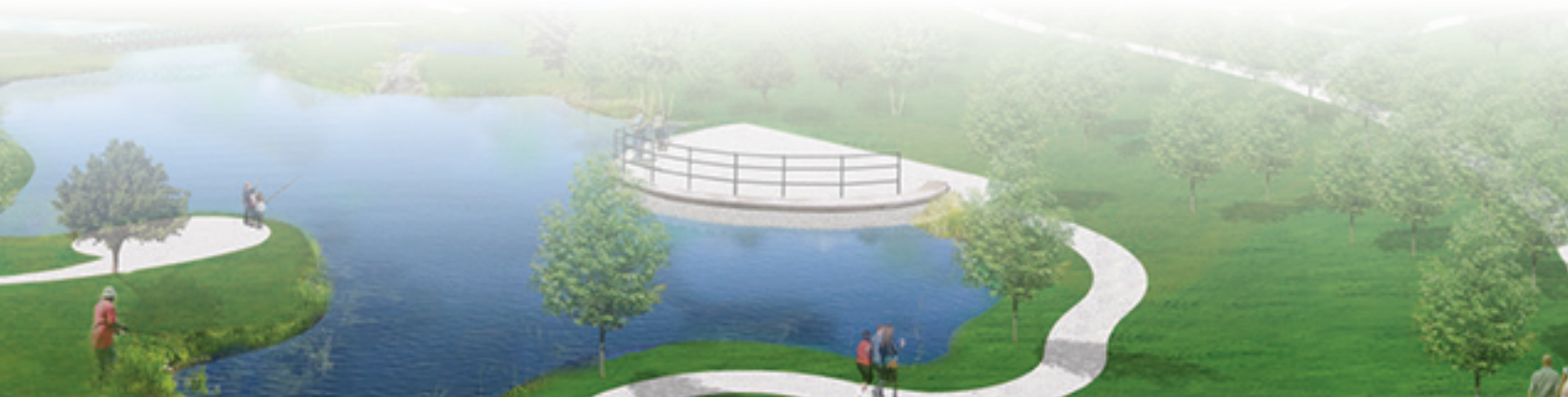
The former Harrison Avenue landfill, in Camden, New Jersey, was laden with solid waste and soil contamination that would seep into the adjacent banks of the Delaware River and interact with tides. Through private donations, public investment and oversight by the New Jersey Department of Environmental Protection Agency, the landfill was transformed in 2014 into the Cramer Hill Waterfront Park. At 62-acres, it is the largest park in the City of Camden.

The park project emphasized shoreline protection, landfill closure, natural resource restoration, and park construction. Saving existing trees and safely planting new ones was critical to the restoration of this natural resource.

- Shoreline protection: regraded and stabilized over 3,000 feet of shoreline on the Delaware River where municipal solid waste and soil contamination (including pesticides and PCBs) were exposed.
- Landfill closure: excavated and redistributed about 375,000 cubic yards of solid waste and soil onto the center of the landfill, installing a passive gas venting system, and constructing a 2-foot-thick semi-permeable cap of clean fill material along with the establishment of vegetation.
- Natural resource restoration: the existing mature trees on the site were preserved for bald eagle foraging habitat. Over 375,000 plants, shrubs, and trees were installed throughout the park to reestablish the waterfront and inland habitat, which doubles as another protective layer to the landfill cap.
- Park construction: the park boasts an amphitheater, entry plaza, a universal playground, exercise stations, a 2-acre pond and fishing plaza, over 3 miles of hiking and biking trails, interpretive signage, a kayak launch, picnic area, sensory garden, shoreline observation areas, and a summit vista with panoramic views of the Philadelphia skyline and Delaware River Waterfront.



Tree and shrub plantings near the confluence of the Copper and Delaware Rivers, May 2020. Photo courtesy of the New Jersey Department of Environmental Protection.



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